

# **SPARC T4-1B Server Module**

## **Service Manual**



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# Using This Documentation

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This service manual explains how to identify faults, replace parts, and add additional options in Oracle's SPARC T4-1B server module.

This document is written for technicians, system administrators, authorized service providers, and users who have experience troubleshooting and replacing hardware.

- "Related Documentation" on page ix
- "Feedback" on page x
- "Support and Accessibility" on page x

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## Related Documentation

Documentation	Links
All Oracle products	<a href="http://www.oracle.com/documentation">http://www.oracle.com/documentation</a>
SPARC T4-1B server module	<a href="http://www.oracle.com/pls/topic/lookup?ctx=SPARCT4-1B">http://www.oracle.com/pls/topic/lookup?ctx=SPARCT4-1B</a>
Sun Blade 6000 modular system	<a href="http://www.oracle.com/pls/topic/lookup?ctx=E19938-01">http://www.oracle.com/pls/topic/lookup?ctx=E19938-01</a>
Oracle Integrated Lights Out Manager (Oracle ILOM)	<a href="http://www.oracle.com/pls/topic/lookup?ctx=ilom30">http://www.oracle.com/pls/topic/lookup?ctx=ilom30</a>

Documentation	Links
Oracle Solaris OS and other system software	<a href="http://www.oracle.com/technetwork/indexes/documentation/#sys_sw">http://www.oracle.com/technetwork/indexes/documentation/#sys_sw</a>
Oracle VTS software	<a href="http://www.oracle.com/pls/topic/lookup?ctx=OracleVTS7.0">http://www.oracle.com/pls/topic/lookup?ctx=OracleVTS7.0</a>
SAS-1/SAS-2 Compatibility	<a href="http://www.oracle.com/pls/topic/lookup?ctx=E22513_01">http://www.oracle.com/pls/topic/lookup?ctx=E22513_01</a>

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<http://www.oracle.com/goto/docfeedback>

## Support and Accessibility

Description	Links
Access electronic support through My Oracle Support	<a href="http://support.oracle.com">http://support.oracle.com</a>  For hearing impaired: <a href="http://www.oracle.com/accessibility/support.html">http://www.oracle.com/accessibility/support.html</a>
Learn about Oracle's commitment to accessibility	<a href="http://www.oracle.com/us/corporate/accessibility/index.html">http://www.oracle.com/us/corporate/accessibility/index.html</a>

# Identifying Components

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These topics explain the components of the server module, focusing on the components that can be removed and replaced for service.

- [“Illustrated Parts Breakdown” on page 1](#)
- [“Front and Rear Panel Components” on page 3](#)

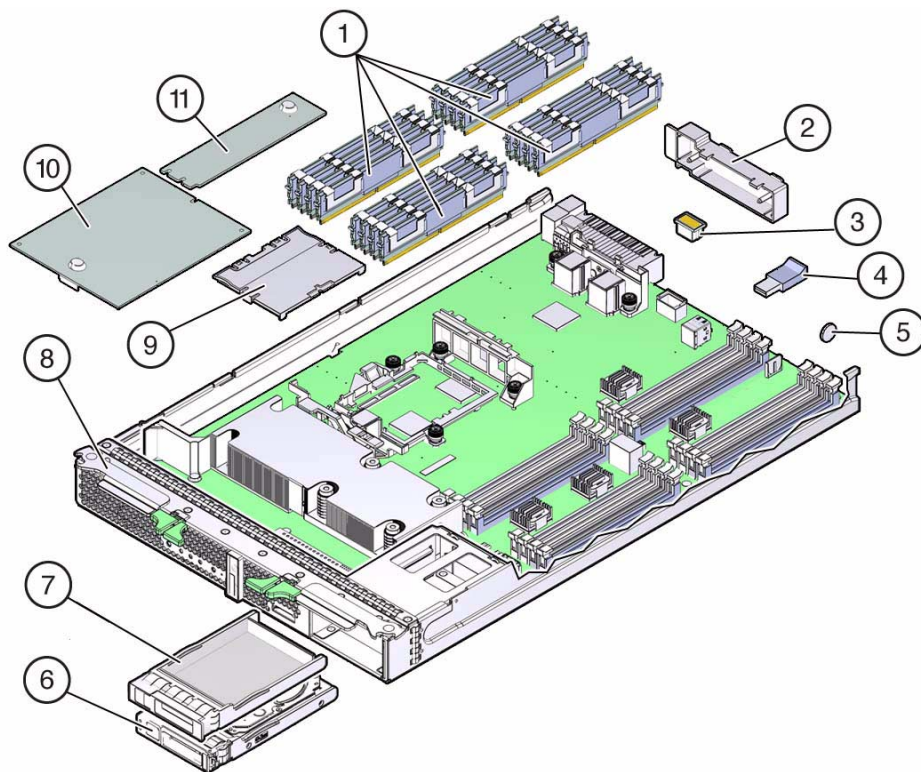
## **Related Information**

- [“Detecting and Managing Faults” on page 5](#)
- [“Replacing the Server Module Enclosure Assembly \(Motherboard\)” on page 115](#)

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## Illustrated Parts Breakdown

This topic identifies components in the server module that you can install, or remove and replace.



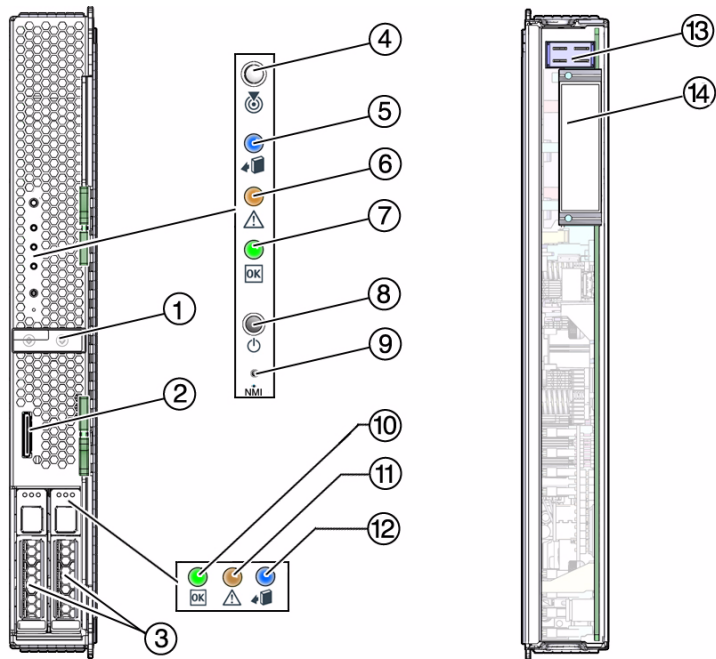
No.	FRU	FRU Name (If Applicable)	Links
1	DIMMs	<i>/SYS/MB/CMP0/BOBn/CHn/Dn</i>	<a href="#">“Servicing Memory” on page 75</a>
2	Rear connector cover		Remove before inserting the server module in a slot.
3	ID PROM	<i>/SYS/MB/SCC</i>	<a href="#">“Servicing the ID PROM” on page 103</a>
4	USB flash drive		<a href="#">“Servicing a USB Flash Drive” on page 107</a>
5	Clock battery	<i>/SYS/MB/BAT</i>	<a href="#">“Servicing the Battery” on page 111</a>
6	Drive (HD or SSD)	<i>/SYS/HDDn</i>	<a href="#">“Servicing Drives” on page 65</a>
7	Drive filler		<a href="#">“Servicing Drives” on page 65</a>
8	Enclosure assembly	<i>/SYS/MB</i>	<a href="#">“Replacing the Server Module Enclosure Assembly (Motherboard)” on page 115</a>
9	SP	<i>/SYS/MB/SP</i>	<a href="#">“Servicing the SP Card” on page 99</a>
10	REM	<i>/SYS/MB/REM</i>	<a href="#">“Servicing the REM” on page 91</a>
11	FEM	<i>/SYS/MB/FEM</i>	<a href="#">“Servicing the FEM” on page 95</a>



**Related Information**

- [“Front and Rear Panel Components” on page 3](#)
- [“Detecting and Managing Faults” on page 5](#)
- [“Replacing the Server Module Enclosure Assembly \(Motherboard\)” on page 115](#)

**Front and Rear Panel Components**



See [“Diagnostics LEDs” on page 10](#) for more information.

No.	Description
1	RFID tag (provides the serial number of the server module)
2	UCP
3	Drive slots
4	White LED: Locator (functions as the physical presence switch)
5	Blue LED: Ready to Remove

No.	Description
6	Amber LED: Fault (Service Action Required)
7	Green LED: OK
8	Power button
9	Reset button: NMI (for service use only)
10	Green LED: Drive OK
11	Amber LED: Drive Fault (Service Action Required)
12	Blue LED: Drive Ready to Remove
13	Rear chassis power connector
14	Rear chassis data connection

### Related Information

- [“Diagnostics LEDs” on page 10](#)
- [“Illustrated Parts Breakdown” on page 1](#)

# Detecting and Managing Faults

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These topics explain how to use various diagnostic tools to monitor server module status and troubleshoot faults in the server module.

- [“Diagnostics Overview” on page 5](#)
- [“Diagnostics Process” on page 7](#)
- [“Diagnostics LEDs” on page 10](#)
- [“Managing Faults \(Oracle ILOM\)” on page 11](#)
- [“Interpreting Log Files and System Messages” on page 23](#)
- [“Checking if Oracle VTS Software Is Installed” on page 27](#)
- [“Managing Faults \(POST\)” on page 29](#)
- [“Managing Faults \(PSH\)” on page 41](#)
- [“Managing Components \(ASR\)” on page 45](#)

## Related Information

- [“Preparing for Service” on page 51](#)

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## Diagnostics Overview

You can use a variety of diagnostic tools, commands, and indicators to monitor and troubleshoot a server module:

- **LEDs** – Provide a quick visual notification of the status of the server module and of some of the FRUs.
- **Oracle ILOM** – This firmware runs on the SP. In addition to providing the interface between the hardware and OS, Oracle ILOM also tracks and reports the health of key server module components. Oracle ILOM works closely with POST and PSH technology to keep the server module running even when there is a faulty component. You can log in to multiple SP accounts simultaneously and have separate Oracle ILOM shell commands executing concurrently under each account.

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**Note** – Unless indicated otherwise, all examples of interaction with the SP are depicted with Oracle ILOM shell commands.

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- **POST** – Performs diagnostics on server module components upon reset to ensure the integrity of those components. POST can be configured and works with Oracle ILOM to take faulty components offline if needed.
- **PSH** – This Oracle Solaris OS technology continuously monitors the health of the CPU, memory, and other components, and works with Oracle ILOM to take a faulty component offline if needed. The PSH technology enables server modules to accurately predict component failures and mitigate many serious problems before they occur.
- **Log files and command interface** – Provide the standard Oracle Solaris OS log files and investigative commands that can be accessed and displayed on the device of your choice.
- **Oracle VTS (formerly SunVTS)** – An application that exercises the server module, provides hardware validation, and discloses possible faulty components with recommendations for repair.

The LEDs, Oracle ILOM, PSH, and many of the log files and console messages are integrated. For example, when the Oracle Solaris OS detects a fault, it displays the fault, logs it, and passes information to Oracle ILOM, where it is logged. Depending on the fault, one or more LEDs might also be illuminated.

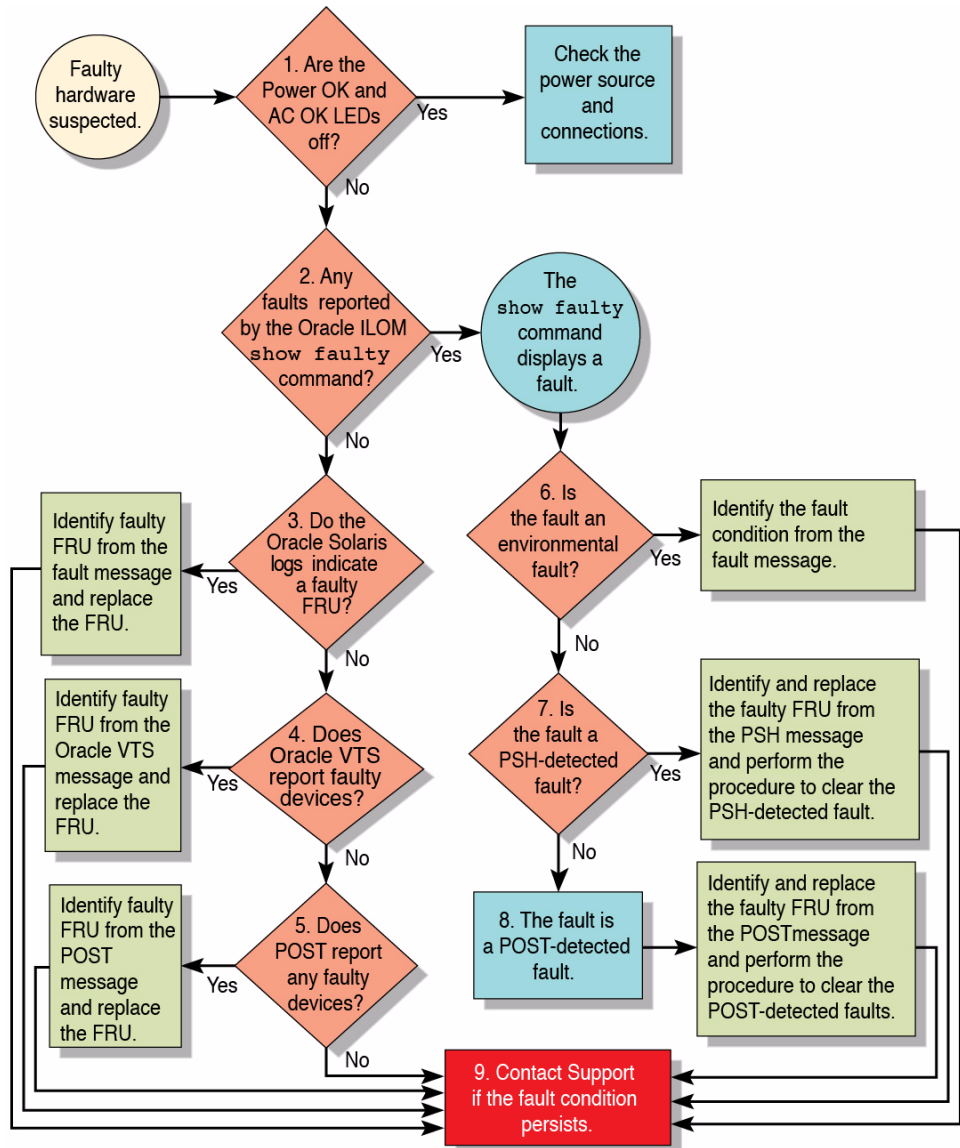
The diagnostic flowchart in [“Diagnostics Process” on page 7](#) illustrates an approach for using the server module diagnostics to identify a faulty FRU. The diagnostics you use, and the order in which you use them, depend on the nature of the problem you are troubleshooting. Therefore, you might perform some actions and not others.

## Related Information

- *Server Module Administration Guide*
- [“Diagnostics Process” on page 7](#)
- [“Diagnostics LEDs” on page 10](#)
- [“Managing Faults \(Oracle ILOM\)” on page 11](#)
- [“Interpreting Log Files and System Messages” on page 23](#)
- [“Managing Faults \(PSH\)” on page 41](#)
- [“Managing Faults \(POST\)” on page 29](#)
- [“Managing Components \(ASR\)” on page 45](#)
- [“Checking if Oracle VTS Software Is Installed” on page 27](#)

# Diagnostics Process

Use the flowchart to understand how to use the server module's diagnostic tools to manage faults. Also see the table that follows this flowchart.



Flowchart No.	Diagnostic Action	Possible Outcome	Additional Information
1.	Check the Power OK LED.	If this LED is not lit, check the power source and ensure that the server module is properly installed in the modular system chassis.	<ul style="list-style-type: none"> <li>• <a href="#">“Diagnostics LEDs” on page 10</a></li> </ul>
2.	Run the Oracle ILOM <code>show faulty</code> command to check for faults.	<p>This command displays the following kinds of faults:</p> <ul style="list-style-type: none"> <li>• Environmental and configuration</li> <li>• PSH-detected</li> <li>• POST-detected</li> </ul> <p>Faulty FRUs are identified in fault messages using the FRU name.</p> <p>All Oracle ILOM detected fault messages begin with the characters <code>SPT</code>.</p>	<ul style="list-style-type: none"> <li>• <a href="#">“Service-Related Oracle ILOM Commands” on page 22</a></li> <li>• <a href="#">“Check for Faults (show faulty Command)” on page 18</a></li> </ul>
3.	Check the Oracle Solaris log files for fault information.	<p>The Oracle Solaris message buffer and log files record system events, and provide information about faults.</p> <ul style="list-style-type: none"> <li>• If system messages indicate a faulty device, replace the FRU.</li> <li>• For more diagnostic information, review the Oracle VTS report. See number 4.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">“Interpreting Log Files and System Messages” on page 23</a></li> </ul>
4.	Run the Oracle VTS software.	<ul style="list-style-type: none"> <li>• If Oracle VTS reports a faulty device, replace it.</li> <li>• If Oracle VTS does not report a faulty device, run POST. See number 5.</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#">“Checking if Oracle VTS Software Is Installed” on page 27</a></li> </ul>
5.	Run POST.	POST performs basic tests of the server module components and reports faulty FRUs.	<ul style="list-style-type: none"> <li>• <a href="#">“Managing Faults (POST)” on page 29</a></li> <li>• <a href="#">“Oracle ILOM Properties That Affect POST Behavior” on page 30</a></li> </ul>
6.	Check if the fault is environmental.	<p>Determine if the fault is an environmental fault or a configuration fault.</p> <p>If the fault listed by the <code>show faulty</code> command displays a temperature or voltage fault, then the fault is an environmental fault. Environmental faults can be caused by faulty FRUs, or by environmental conditions such as when computer room ambient temperature is too high, or airflow is blocked. When the environmental condition is corrected, the fault automatically clears.</p>	<ul style="list-style-type: none"> <li>• <a href="#">“Check for Faults (show faulty Command)” on page 18</a></li> </ul>

Flowchart No.	Diagnostic Action	Possible Outcome	Additional Information
7.	Determine if the fault was detected by PSH.	If the fault message does not begin with the characters <i>SPT</i> , the fault was detected by the PSH feature. After the FRU is replaced, perform the procedure to clear PSH detected faults.	<ul style="list-style-type: none"> <li>• “Managing Faults (PSH)” on page 41</li> <li>• “Clear PSH-Detected Faults” on page 44</li> </ul>
8.	Determine if the fault was detected by POST.	POST performs basic tests of the server module components and reports faulty FRUs. When POST detects a faulty FRU, POST logs the fault and if possible, takes the FRU offline. POST detected FRUs display the following text in the fault message: <i>Forced fail reason</i> where <i>reason</i> is the name of the power-on routine that detected the failure.	<ul style="list-style-type: none"> <li>• “Managing Faults (POST)” on page 29</li> <li>• “Clear POST-Detected Faults” on page 37</li> <li>• “POST Output Reference” on page 39</li> </ul>
9.	Contact technical support.	The majority of hardware faults are detected by the server module’s diagnostics. In rare cases a problem might require additional troubleshooting. If you are unable to determine the cause of the problem, contact Oracle Support or go to: <a href="http://support.oracle.com">http://support.oracle.com</a>	<ul style="list-style-type: none"> <li>• “Support and Accessibility” on page x</li> </ul>





## Related Information

- *Server Module Administration Guide*
- “Diagnostics Overview” on page 5
- “Diagnostics LEDs” on page 10
- “Managing Faults (Oracle ILOM)” on page 11
- “Interpreting Log Files and System Messages” on page 23
- “Managing Faults (PSH)” on page 41
- “Managing Faults (POST)” on page 29
- “Managing Components (ASR)” on page 45
- “Checking if Oracle VTS Software Is Installed” on page 27





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# Diagnostics LEDs

The server module has LEDs on the front panel and on the drives. The LEDs conform to ANSI SIS. For the locations of these LEDs, see [“Front and Rear Panel Components”](#) on page 3, and [“Drive LEDs”](#) on page 67.

LED or Button	Icon or Label	Color	Description
Locator LED and button		White	<p>You can turn on the Locator LED to identify a particular server module. When on, the LED blinks rapidly. There are two methods for turning a Locator LED on:</p> <ul style="list-style-type: none"><li>• Issuing the Oracle ILOM command <code>set /SYS/LOCATE value=Fast_Blink</code>.</li><li>• Pressing the Locator button.</li></ul> <p>The Locator LED functions as the physical presence switch.</p>
Ready to Remove LED		Blue	<p>Steady state – If LED is off, it is not safe to remove the server module from the modular system chassis. You must use Oracle ILOM to shut down the server module and put the blade into ready to remove state before this LED is on.</p>
Service Action Required LED		Amber	<p>Indicates that service is required. POST and Oracle ILOM are two diagnostics tools that can detect a fault or failure resulting in this indication. Also, faults detected by PSH can result in Oracle ILOM lighting this LED.</p> <p>The Oracle ILOM <code>show faulty</code> command provides details about any faults that cause this indicator to light.</p> <p>Under some fault conditions, individual component fault LEDs are turned on in addition to the Service Action Required LED.</p>
Power OK LED		Green	<p>Indicates the following conditions:</p> <ul style="list-style-type: none"><li>• Off – Host is not running in its normal state. Host power might be off. The SP might be running.</li><li>• Steady on – Host is powered on and is running in its normal operating state. No service actions are required.</li><li>• Fast blink – Host is running in standby mode and can be quickly returned to full function.</li><li>• Slow blink – A normal, but transitory activity is taking place. Slow blinking might indicate that diagnostics are running, or the host is booting.</li></ul>



LED or Button	Icon or Label	Color	Description
On/Standby button		n/a	The recessed Power button toggles the host on or off. <ul style="list-style-type: none"> <li>Press once to turn the host on.</li> <li>Press once to shut the host down to a standby state.</li> <li>Press and hold for 4 seconds to perform an emergency shutdown.</li> </ul>
Drive Ready to Remove LED		Blue	Indicates that the drive can be removed during a hot-plug operation.
Drive Service Action Required LED		Amber	Indicates that the drive has experienced a fault condition.
Drive OK/Activity LED		Green	Indicates the following drive status: <ul style="list-style-type: none"> <li>On – Drive is idle and available for use.</li> <li>Off – Read or write activity is in progress.</li> </ul>

### Related Information

- [“Diagnostics Overview” on page 5](#)
- [“Diagnostics Process” on page 7](#)
- [“Managing Faults \(Oracle ILOM\)” on page 11](#)
- [“Interpreting Log Files and System Messages” on page 23](#)
- [“Managing Faults \(PSH\)” on page 41](#)
- [“Managing Faults \(POST\)” on page 29](#)
- [“Managing Components \(ASR\)” on page 45](#)
- [“Checking if Oracle VTS Software Is Installed” on page 27](#)

## Managing Faults (Oracle ILOM)

These topics explain how to use Oracle ILOM, the SP firmware, to diagnose faults and verify successful repairs.

- [“Oracle ILOM Troubleshooting Overview” on page 12](#)
- [“Access the SP \(Oracle ILOM\)” on page 15](#)
- [“Display FRU Information \(show Command\)” on page 17](#)

- “Check for Faults (show faulty Command)” on page 18
- “Check for Faults (fmadm faulty Command)” on page 20
- “Clear Faults (clear\_fault\_action Property)” on page 21
- “Service-Related Oracle ILOM Commands” on page 22
- “Oracle ILOM Properties That Affect POST Behavior” on page 30

### **Related Information**

- “Diagnostics Overview” on page 5
- “Diagnostics Process” on page 7
- “Interpreting Log Files and System Messages” on page 23
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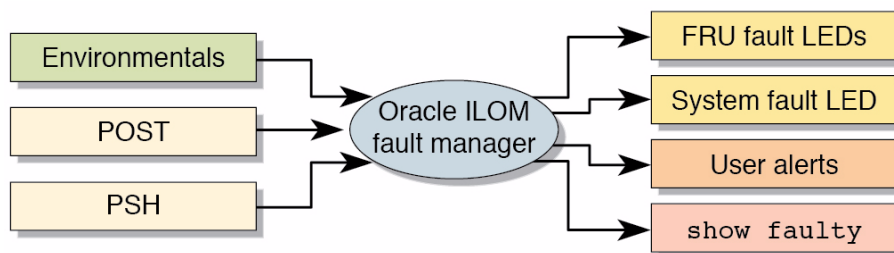
## **Oracle ILOM Troubleshooting Overview**

Oracle ILOM enables you to remotely run diagnostics, such as POST, that would otherwise require physical proximity to the server module. You can also configure Oracle ILOM to send email alerts of hardware failures, hardware warnings, and other events related to the server module or Oracle ILOM.

The SP runs independently of the server module, using the server module’s standby power. Therefore, Oracle ILOM continues to function when the server module OS goes offline or when the server module is powered off.

## **Fault Management**

Error conditions detected by Oracle ILOM, POST, and PSH are forwarded to Oracle ILOM for fault handling.



The Oracle ILOM fault manager evaluates error messages it receives to determine whether the condition being reported should be classified as an alert or a fault.

- **Alerts** – When the fault manager determines that an error condition being reported does not indicate a faulty FRU, the fault manager classifies the error as an alert.

Alert conditions are often caused by environmental conditions, such as computer room temperature, which might improve over time. Conditions might also be caused by a configuration error, such as the wrong DIMM type being installed.

If the conditions responsible for the alert go away, the fault manager will detect the change and will stop logging alerts for that condition.

- **Faults** – When the fault manager determines that a particular FRU has an error condition that is permanent, that error is classified as a fault. This condition causes the Service Action Required LEDs to be turned on, the FRUID PROMs updated, and a fault message logged. If the FRU has status LEDs, the Service Action Required LED for that FRU will also be turned on.

You must replace a FRU identified as having a *fault* condition.

In the event of a system fault, Oracle ILOM ensures that the Service Action Required LED is turned on, FRUID PROMs are updated, the fault is logged, and alerts are displayed. Faulty FRUs are identified in fault messages using the FRU name.

## Fault Clearing

The SP can detect when a fault is no longer present. When this happens, it clears the fault state in the FRU PROM and extinguishes the Service Action Required LED.

A fault condition can be removed in two ways:

- **Unaided recovery** – Faults caused by environmental conditions can clear automatically if the condition responsible for the fault is no longer present.
- **Repaired fault** – When a fault is repaired by human intervention, such as a FRU replacement, the SP will usually detect the repair automatically and extinguish the Service Action Required LED. If the SP does not perform these actions, you must

perform these tasks manually by setting the Oracle ILOM `component_state` or `fault_state` of the faulted component. The procedure for clearing faults manually is described in [“Clear Faults \(clear\\_fault\\_action Property\)” on page 21](#).

Many environmental faults can automatically recover. For example, a temporary condition might cause the computer room temperature to rise above the maximum threshold, producing an `overtemperature` fault in the server module. If the computer room temperature then returns to the normal range and the server module’s internal temperature also drops back to an acceptable level, the SP will detect the new fault-free condition. The SP will extinguish the Service Action Required LED and clear the fault state from the FRU PROM.

The SP can automatically detect when a FRU is removed. In many cases, the SP does this even if you remove the FRU while the SP is not running. This function enables Oracle ILOM to sense that a fault, diagnosed to a specific FRU, has been repaired.

---

**Note** – Oracle ILOM does not automatically detect drive replacement. Oracle ILOM does not automatically clear voltage sensor faults.

---

## Oracle Solaris Fault Manager Commands in Oracle ILOM

The Oracle ILOM CLI includes a feature that enables you to access Oracle Solaris fault manager commands, such as `fmadm`, `fmdump`, and `fmstat`, from within the Oracle ILOM shell. This feature is referred to as the Oracle ILOM `faultmgmt` shell.

### Drive Faults

PSH does not monitor drives for faults. As a result, the SP does not recognize drive faults and will not light the fault LEDs on either the server module or the drive itself. Use the Oracle Solaris message files to view drive faults. See [“View System Message Log Files” on page 24](#).

#### Related Information

- Oracle ILOM 3.0 documentation
- *Server Module Administration Guide*
- [“Oracle ILOM Troubleshooting Overview” on page 12](#)
- [“Access the SP \(Oracle ILOM\)” on page 15](#)
- [“Display FRU Information \(show Command\)” on page 17](#)
- [“Check for Faults \(show faulty Command\)” on page 18](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 20](#)

- “Clear Faults (clear\_fault\_action Property)” on page 21
- “Service-Related Oracle ILOM Commands” on page 22
- “Oracle ILOM Properties That Affect POST Behavior” on page 30

## ▼ Access the SP (Oracle ILOM)

You can access the server module’s SP either directly or through the CMM of the modular system. You can manage the server module through the Oracle ILOM CLI or through the Oracle ILOM web interface.

Use this procedure to log into the CMM to access the SP and to use the Oracle ILOM CLI.

For alternative methods to access the server module SP, refer to the *Server Module Installation Guide*.

### 1. Establish connectivity to the CMM using one of the following methods:

- **SER MGT port** – Connect a terminal device (such as an ASCII terminal or laptop with terminal emulation) to the CMM SER MGT port.  
Set up your terminal device for 9600 baud, 8 bit, no parity, 1 stop bit, and no handshaking, and use a null-modem configuration (transmit and receive signals crossed over to enable DTE-to-DTE communication).
- **NET MGT port** – Connect this CMM port to your Ethernet network. On the CMM, this connector is labeled NET MGT. This port requires an IP address. By default, this port uses DHCP to obtain an IP address, or you can assign a static IP address.

---

**Note** – Alternatively, you can connect directly to the server module SP by using a dongle cable to connect to the server module SER MGT or NET MGT ports. For more information, refer to the *Server Module Installation Guide*.

---

### 2. Decide which interface to use.

- **Oracle ILOM CLI (default)** – Most of the commands and examples in this document use this interface. The default login account is `root` with a password of `changeme`.
- **Oracle ILOM web interface** – Can be used when you access the SP through the NET MGT port and have a browser. Refer to the Oracle ILOM 3.0 documentation for details. This interface is not referenced in this document.

### 3. Open an SSH session to log into Oracle ILOM on the CMM.

The default Oracle ILOM login account is `root` with a default password of `changeme`. The password might be different in your environment.

```
ssh root@CMM_IP_Address
Password:
Waiting for daemons to initialize...
Daemons ready
Oracle (R) Integrated Lights Out Manager
Version 3.0
Copyright (c) 2011, Oracle and/or its affiliates, Inc. All rights reserved.
Warning: password is set to factory default.
->
```

The Oracle ILOM prompt (`->`) indicates that you are accessing the Oracle ILOM CLI.

### 4. Navigate to the server module.

```
-> cd /CH/BLn/SP/cli
```

Replace *n* with an integer that identifies the target server module (the slot in which the server module is installed).

### 5. Start the server module SP Oracle ILOM CLI.

```
-> start
Are you sure you want to start /CH/BL0/SP/cli? y
start: Connecting to /CH/BL0/SP/cli using Single Sign On
```

### 6. Perform Oracle ILOM commands that provide the diagnostic information you need.

These commands are commonly used for fault management:

- **show command** – Displays information about individual FRUs.  
See [“Display FRU Information \(show Command\)” on page 17](#).
- **show faulty command** – Displays environmental, POST-detected, and PSH-detected faults.  
See [“Check for Faults \(show faulty Command\)” on page 18](#).

---

**Note** – You can use `fmadm faulty` in the Oracle ILOM `faultmgmt` shell as an alternative to `show faulty`.

---

- `clear_fault_action` **property of the set command** – Manually clears PSH-detected faults.

See “Clear Faults (`clear_fault_action` Property)” on page 21.

### Related Information

- Oracle ILOM 3.0 documentation
- “Display FRU Information (`show` Command)” on page 17
- “Check for Faults (`show faulty` Command)” on page 18
- “Check for Faults (`fmadm faulty` Command)” on page 20
- “Clear Faults (`clear_fault_action` Property)” on page 21
- “Service-Related Oracle ILOM Commands” on page 22
- “Oracle ILOM Properties That Affect POST Behavior” on page 30

## ▼ Display FRU Information (`show` Command)

Use the Oracle ILOM `show` command to display information about individual FRUs.

- **At the Oracle ILOM prompt, type the `show` command.**

In the following example, the `show` command displays information about a memory module.

```
-> show /SYS/MB/CMP0/BOB0/CH0/D0

/SYS/MB/CMP0/BOB0/CH0/D0
Targets:
  T_AMB
  SERVICE

Properties:
  Type = DIMM
  ipmi_name = P0/B0/C0/D0
  component_state = Enabled
  fru_name = 8192MB DDR3 SDRAM
  fru_description = DDR3 DIMM 8192 Mbytes
  fru_manufacturer = Samsung
  fru_version = 00
  fru_part_number = *****
  fru_serial_number = *****
  fault_state = OK
  clear_fault_action = (none)
```

## Related Information

- “Diagnostics Process” on page 7
- “Access the SP (Oracle ILOM)” on page 15
- “Check for Faults (show faulty Command)” on page 18
- “Check for Faults (fmadm faulty Command)” on page 20
- “Clear Faults (clear\_fault\_action Property)” on page 21
- “Service-Related Oracle ILOM Commands” on page 22

## ▼ Check for Faults (show faulty Command)

Use the Oracle ILOM `show faulty` command to display the following kinds of faults and alerts:

- **Environmental or configuration faults** – Faults caused by temperature or voltage problems that might be caused by a faulty fan or power input. Environmental faults can also be caused by room temperature or blocked air flow.
- **POST-detected faults** – Faults on devices detected by the POST diagnostics.
- **PSH-detected faults** – Faults detected by PSH.

1. At the Oracle ILOM prompt, type the `show faulty` command.
2. If a fault is displayed, check the output to determine the nature of the fault.

The following examples show the different kinds of output that might be displayed:

- Example of the `show faulty` command when no faults are present:

```
-> show faulty
Target                | Property                | Value
-----+-----+-----
-
-
-
->
```

- Example of the `show faulty` command displaying a fault when one of the AC inputs for the chassis power supply PS0 is not plugged in:

```
-> show faulty
Target                | Property                | Value
-----+-----+-----
/SP/faultmgmt/0      | fru                    | /SYS/PS0
/SP/faultmgmt/0      | class                  | fault.chassis.env.power.loss
faults/0              |                        |
```



/SP/faultmgmt/0 faults/0	sunw-msg-id	SPT-8000-5X
/SP/faultmgmt/0 faults/0	uuid	64d52ce4-614e-693f-bb71-ea3f829d ad73
/SP/faultmgmt/0 faults/0	timestamp	2011-10-14/20:14:13
/SP/faultmgmt/0 faults/0	detector	/SYS/PS0/S1/V_IN_ERR
/SP/faultmgmt/0 faults/0	product_serial_number	1030NND0D2
/SP/faultmgmt/0 faults/0	chassis_serial_number	0000000-0000000000
->		

- Example of the show faulty command displaying a fault that was detected by POST. These kinds of faults are identified by the message Forced fail *reason*, where *reason* is the name of the power-on routine that detected the fault. For more information, see “Managing Faults (POST)” on page 29.

-> show faulty		
Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/MB/CMP0/BOB1/CH0/D0
/SP/faultmgmt/0/ faults/0	timestamp	Oct 12 16:40:56
/SP/faultmgmt/0/ faults/0	sp_detected_fault	/SYS/MB/CMP0/BOB1/CH0/D0 Forced fail (POST)

- Example of the show faulty command displaying a fault that was detected by PSH. These kinds of faults are identified by the presence of a UUID value.

-> show faulty		
Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/MB
/SP/faultmgmt/0/ faults/0	class	fault.fruid.replay
/SP/faultmgmt/0/ faults/0	sunw-msg-id	PCIEX-8000-8R
/SP/faultmgmt/0/ faults/0	uuid	c448cc2b-9f9e-4ae7-c494-c8fe99ed dd58
/SP/faultmgmt/0/ faults/0	timestamp	2011-08-29/16:31:51
/SP/faultmgmt/0/ faults/0	chassis_serial_number	*****_*****
/SP/faultmgmt/0/ faults/0	product_serial_number	*****

/SP/faultmgmt/0/ faults/0	fru_serial_number	465769T+*****
/SP/faultmgmt/0/ faults/0	fru_part_number	7015272
->		

### Related Information

- “Diagnostics Process” on page 7
- “Access the SP (Oracle ILOM)” on page 15
- “Display FRU Information (show Command)” on page 17
- “Check for Faults (fmadm faulty Command)” on page 20
- “Clear Faults (clear\_fault\_action Property)” on page 21
- “Service-Related Oracle ILOM Commands” on page 22

## ▼ Check for Faults (fmadm faulty Command)

The following is an example of the `fmadm faulty` command, which is an alternative to the `show faulty` command.

You must run the Oracle Solaris `fmadm faulty` command from within the Oracle ILOM `faultmgmt` shell.

---

**Note** – The characters `SPT` at the beginning of a message ID indicate that Oracle ILOM detected the fault.

---

1. At the Oracle ILOM prompt, access the Oracle ILOM `faultmgmt` shell.

```
-> start /SP/faultmgmt/shell
Are you sure you want to start /SP/faultmgmt/shell (y/n)? y
```

2. At the `faultmgmtsp>` prompt, type the `fmadm faulty` command.

```
faultmgmtsp> fmadm faulty
-----
Time                UUID                                msgid              Severity
-----
2011-08-11/14:54:23 *****_*****_*****_*****_***** SPT-8000-LC  Critical
...
```

3. Type the `exit` command when you are finished using the Oracle ILOM `faultmgt` shell.

```
faultmgmtsp> exit
```

#### Related Information

- [“Diagnostics Process” on page 7](#)
- [“Access the SP \(Oracle ILOM\)” on page 15](#)
- [“Display FRU Information \(show Command\)” on page 17](#)
- [“Check for Faults \(show faulty Command\)” on page 18](#)
- [“Clear Faults \(clear\\_fault\\_action Property\)” on page 21](#)
- [“Service-Related Oracle ILOM Commands” on page 22](#)

## ▼ Clear Faults (clear\_fault\_action Property)

Use the `clear_fault_action` property with the `set` command to manually clear PSH-detected faults for a FRU.

If Oracle ILOM detects a FRU replacement, it will automatically clear the fault. For PSH-diagnosed faults, if the replacement of the FRU is detected by the SP or the fault is manually cleared on the host, the fault will also be cleared from Oracle ILOM. In such cases, you typically do not have to clear the fault manually.

---

**Note** – This procedure clears the fault from the SP but not from the host. If the fault persists in the host, clear it manually as described in [“Clear PSH-Detected Faults” on page 44](#).

---

- **At the Oracle ILOM prompt, use the `set` command with the `clear_fault_action=True` property.**

For example:

```
-> set /SYS/MB/CMP0/BOB0/CH0/D0 clear_fault_action=True
Are you sure you want to clear /SYS/MB/CMP0/BOB0/CH0/D0 (y/n)? y
Set 'clear_fault_action' to 'true'
```

#### Related Information

- [“Diagnostics Process” on page 7](#)
- [“Access the SP \(Oracle ILOM\)” on page 15](#)
- [“Display FRU Information \(show Command\)” on page 17](#)

- [“Check for Faults \(show faulty Command\)” on page 18](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 20](#)
- [“Service-Related Oracle ILOM Commands” on page 22](#)

## Service-Related Oracle ILOM Commands

These are the Oracle ILOM shell commands most frequently used when performing service-related tasks.

Oracle ILOM Command	Description
<code>help [command]</code>	Displays a list of all available commands with syntax and descriptions. Specifying a command name as an option displays help for that command.
<code>set /HOST send_break_action=break</code>	Takes the host server module from the OS to either <code>kmdb</code> or <code>OBP</code> (equivalent to a Stop-A), depending on the mode Oracle Solaris software was booted.
<code>set /SYS/component clear_fault_action=true</code>	Manually clears host-detected faults. The <i>component</i> is the unique ID of the device with a fault to be cleared.
<code>start /HOST/console</code>	Connects to the host.
<code>show /HOST/console/history</code>	Displays the contents of the host’s console buffer.
<code>set /HOST/bootmode property=value</code>	Controls the host server module OBP firmware method of booting. <i>property</i> is <i>state</i> , <i>config</i> , or <i>script</i>
<code>stop /SYS</code> <code>start /SYS</code>	Powers off the host server module and then powers on the host server module.
<code>stop /SYS</code>	Powers off the host server module.
<code>start /SYS</code>	Powers on the host server module.
<code>reset /SYS</code>	Generates a hardware reset on the host server module.
<code>reset /SP</code>	Reboots the SP.
<code>set /SYS keyswitch_state=value</code>	Sets the virtual keyswitch. <i>value</i> is <i>normal</i> , <i>standby</i> , <i>diag</i> , or <i>locked</i> .
<code>set /SYS/LOCATE value=value</code>	Turns the Locator LED on the server module on or off. <i>value</i> is <i>Fast_blink</i> or <i>Off</i> .
<code>show faulty</code>	Displays current server module faults. See <a href="#">“Check for Faults (show faulty Command)” on page 18</a> .
<code>show /SYS keyswitch_state</code>	Displays the status of the virtual keyswitch.

Oracle ILOM Command	Description
<code>show /SYS/LOCATE</code>	Displays the current state of the Locator LED as either on or off.
<code>show /SP/logs/event/list</code>	Displays the history of all events logged in the SP event buffers (in RAM or the persistent buffers).
<code>show /HOST</code>	Displays information about the operating state of the host, whether the hardware is providing service, and firmware version information.
<code>show /SYS</code>	Displays information about the server module, including the serial number.

### Related Information

- [“Oracle ILOM Troubleshooting Overview” on page 12](#)
- [“Access the SP \(Oracle ILOM\)” on page 15](#)
- [“Display FRU Information \(show Command\)” on page 17](#)
- [“Check for Faults \(show faulty Command\)” on page 18](#)
- [“Check for Faults \(fmadm faulty Command\)” on page 20](#)
- [“Clear Faults \(clear\\_fault\\_action Property\)” on page 21](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 30](#)

## Interpreting Log Files and System Messages

With the Oracle Solaris OS running on the server module, you have the full complement of Oracle Solaris OS files and commands available for collecting information and for troubleshooting.

If POST or the PSH features do not indicate the source of a fault, check the message buffer and log files for notifications for faults. Drive faults are usually captured by the Oracle Solaris message files.

- [“Check the Message Buffer \(dmesg Command\)” on page 24](#)
- [“View System Message Log Files” on page 24](#)
- [“List FRU Status \(prtdiag Command\)” on page 25](#)

### Related Information

- [“Diagnostics Overview” on page 5](#)
- [“Diagnostics Process” on page 7](#)
- [“Managing Faults \(Oracle ILOM\)” on page 11](#)
- [“Managing Faults \(PSH\)” on page 41](#)
- [“Managing Faults \(POST\)” on page 29](#)
- [“Managing Components \(ASR\)” on page 45](#)
- [“Checking if Oracle VTS Software Is Installed” on page 27](#)

## ▼ Check the Message Buffer (dmesg Command)

The `dmesg` command checks the system buffer for recent diagnostic messages and displays them.

1. **Log in as superuser.**
2. **Type.**

```
# dmesg
```

### Related Information

- [“View System Message Log Files” on page 24](#)
- [“List FRU Status \(prtdiag Command\)” on page 25](#)

## ▼ View System Message Log Files

The error logging daemon, `syslogd`, automatically records various system warnings, errors, and faults in message files. These messages can alert you to system problems such as a device that is about to fail.

The `/var/adm` directory contains several message files. The most recent messages are in the `/var/adm/messages` file. After a period of time (usually every week), a new message file is automatically created. The original contents of the `messages` file are rotated to a file named `messages.0`. Over a period of time, the messages are further rotated to `messages.1` and `messages.2`, and then deleted.

1. **Log in as superuser.**

## 2. Type.

```
# more /var/adm/messages
```

Or, if you want to view all logged messages, type:

```
# more /var/adm/messages*
```

### Related Information

- [“Check the Message Buffer \(dmesg Command\)” on page 24](#)

## ▼ List FRU Status (prtdiag Command)

- At an Oracle Solaris OS command line, type the `prtdiag` command.

FRU status information is displayed.

Example:

```
# prtdiag
System Configuration:  Oracle Corporation  sun4v SPARC T4-1B
Memory size: 130560 Megabytes

===== Virtual CPUs =====

CPU ID Frequency Implementation      Status
-----
0      2848 MHz  SPARC-T4          on-line
1      2848 MHz  SPARC-T4          on-line
2      2848 MHz  SPARC-T4          on-line
<...>
<...>
61     2848 MHz  SPARC-T4          on-line
62     2848 MHz  SPARC-T4          on-line
63     2848 MHz  SPARC-T4          on-line

===== Physical Memory Configuration =====
Segment Table:
-----
Base          Segment  Interleave  Bank    Contains
Address       Size      Factor     Size    Modules
-----
0x0           128 GB   2          64 GB   /SYS/MB/CMP0/BOB0/CH0/D0
                                           /SYS/MB/CMP0/BOB0/CH0/D1
```

64 GB

/SYS/MB/CMP0/BOB0/CH1/D0  
 /SYS/MB/CMP0/BOB0/CH1/D1  
 /SYS/MB/CMP0/BOB1/CH0/D0  
 /SYS/MB/CMP0/BOB1/CH0/D1  
 /SYS/MB/CMP0/BOB1/CH1/D0  
 /SYS/MB/CMP0/BOB1/CH1/D1  
 /SYS/MB/CMP0/BOB2/CH0/D0  
 /SYS/MB/CMP0/BOB2/CH0/D1  
 /SYS/MB/CMP0/BOB2/CH1/D0  
 /SYS/MB/CMP0/BOB2/CH1/D1  
 /SYS/MB/CMP0/BOB3/CH0/D0  
 /SYS/MB/CMP0/BOB3/CH0/D1  
 /SYS/MB/CMP0/BOB3/CH1/D0  
 /SYS/MB/CMP0/BOB3/CH1/D1

===== IO Devices =====

Slot + Status	Bus Type	Name + Path	Model
/SYS/MB/REM	PCIE	LSI,sas-pciex1000,72 /pci@400/pci@1/pci@0/pci@c/LSI,sas@0	LSI,2008
/SYS/MB/FEM0	PCIE	network-pciex108e,aaaa /pci@400/pci@2/pci@0/pci@6/network@0	SUNW,pcie-hydra
/SYS/MB/NET0	PCIE	network-pciex8086,10c9 /pci@400/pci@2/pci@0/pci@c/network@0	
/SYS/MB/NET1	PCIE	network-pciex8086,10c9 /pci@400/pci@2/pci@0/pci@c/network@0,1	
/SYS/MB/USB	PCIE	usb-pciiclass,0c0310 /pci@400/pci@1/pci@0/pci@0/pci@0/usb@0	
/SYS/MB/USB	PCIE	usb-pciiclass,0c0310 /pci@400/pci@1/pci@0/pci@0/pci@0/usb@0,1	
/SYS/MB/USB	PCIE	usb-pciiclass,0c0320 /pci@400/pci@1/pci@0/pci@0/pci@0/usb@0,2	
/SYS/MB/VIDEO	PCIX	display-pci1a03,2000 /pci@400/pci@2/pci@0/pci@d/pci@0/display@0	

===== Environmental Status =====

Fan sensors:

All fan sensors are OK.

Fan indicators:

All fan indicators are OK.

Temperature sensors:

All temperature sensors are OK.

Temperature indicators:

All temperature indicators are OK.



```
Current sensors:
All current sensors are OK.

Current indicators:
All current indicators are OK.

Voltage sensors:
All voltage sensors are OK.

Voltage indicators:
All voltage indicators are OK.

===== FRU Status =====
All FRUs are enabled.
```

### Related Information

- [“Check the Message Buffer \(dmesg Command\)” on page 24](#)
- [“View System Message Log Files” on page 24](#)
- [“Display FRU Information \(show Command\)” on page 17](#)

---

## Checking if Oracle VTS Software Is Installed

Oracle VTS (previously named SunVTS) is a validation test suite that you can use to test this server module. These topics provide an overview and a way to check if Oracle VTS is installed. For comprehensive Oracle VTS information, refer to the Oracle VTS documentation.

- [“Oracle VTS Overview” on page 28](#)
- [“Check if Oracle VTS Software Is Installed” on page 28](#)

### Related Information

- [“Diagnostics Overview” on page 5](#)
- [“Diagnostics Process” on page 7](#)
- [“Managing Faults \(Oracle ILOM\)” on page 11](#)
- [“Interpreting Log Files and System Messages” on page 23](#)
- [“Managing Faults \(PSH\)” on page 41](#)

- [“Managing Faults \(POST\)” on page 29](#)
- [“Managing Components \(ASR\)” on page 45](#)

## Oracle VTS Overview

Oracle VTS is a validation test suite that you can use to test this server module. Oracle VTS provides multiple diagnostic hardware tests that verify the connectivity and functionality of most hardware controllers and devices for this server module. The software provides these kinds of test categories:

- Audio
- Communication (serial and parallel)
- Graphic and video
- Memory
- Network
- Peripherals (hard drives, CD-DVD devices, and printers)
- Processor
- Storage

Use Oracle VTS to validate a server module during development, production, receiving inspection, troubleshooting, periodic maintenance, and system or subsystem stressing.

You can run Oracle VTS through a web browser, a terminal, or CLI.

You can run tests in a variety of modes for online and offline testing.

Oracle VTS also provides a choice of security mechanisms.

Oracle VTS software is provided in the preinstalled Oracle Solaris OS that shipped with the server module.

### Related Information

- Oracle VTS documentation
- [“Check if Oracle VTS Software Is Installed” on page 28](#)

## ▼ Check if Oracle VTS Software Is Installed

1. **Log in as superuser.**

## 2. Check for the presence of Oracle VTS packages.

```
# pkginfo -l SUNWvts SUNWvtsr SUNWvtsts SUNWvtsmn
```

- If information about the packages is displayed, then Oracle VTS software is installed.
- If you receive messages reporting `ERROR: information for package was not found`, then Oracle VTS is not installed. You must install the software before you can use it. You can obtain the Oracle VTS software from the following places:
  - Oracle Solaris OS media kit (DVDs)
  - As a download from the web

### Related Information

- Oracle VTS documentation

---

# Managing Faults (POST)

These topics explain how to use POST as a diagnostic tool.

- [“POST Overview” on page 30](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 30](#)
- [“Configure POST” on page 33](#)
- [“Run POST With Maximum Testing” on page 35](#)
- [“Interpret POST Fault Messages” on page 37](#)
- [“Clear POST-Detected Faults” on page 37](#)
- [“POST Output Reference” on page 39](#)

### Related Information

- [“Diagnostics Overview” on page 5](#)
- [“Diagnostics Process” on page 7](#)
- [“Managing Faults \(Oracle ILOM\)” on page 11](#)
- [“Interpreting Log Files and System Messages” on page 23](#)
- [“Managing Faults \(PSH\)” on page 41](#)
- [“Managing Components \(ASR\)” on page 45](#)
- [“Checking if Oracle VTS Software Is Installed” on page 27](#)

# POST Overview

POST is a group of PROM-based tests that run when the server module is powered on or when it is reset. POST checks the basic integrity of the critical hardware components in the server module (CPU, memory, and I/O subsystem).

You can also run POST as a system-level hardware diagnostic tool. To do this, use the Oracle ILOM `set` command to set the parameter `keyswitch_state` to `diag`.

You can also set other Oracle ILOM properties to control various other aspects of POST operations. For example, you can specify the events that cause POST to run, the level of testing POST performs, and the amount of diagnostic information POST displays. These properties are listed and described in [“Oracle ILOM Properties That Affect POST Behavior” on page 30](#).

If POST detects a faulty component, the component is disabled automatically. If the server module is able to run without the disabled component, it will boot when POST completes its tests. For example, if POST detects a faulty processor core, the core will be disabled. After POST completes its test sequence, the server module boots and uses the remaining cores.

## Related Information

- [“Diagnostics Overview” on page 5](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 30](#)
- [“Configure POST” on page 33](#)
- [“Run POST With Maximum Testing” on page 35](#)
- [“Interpret POST Fault Messages” on page 37](#)
- [“Clear POST-Detected Faults” on page 37](#)
- [“POST Output Reference” on page 39](#)

## Oracle ILOM Properties That Affect POST Behavior

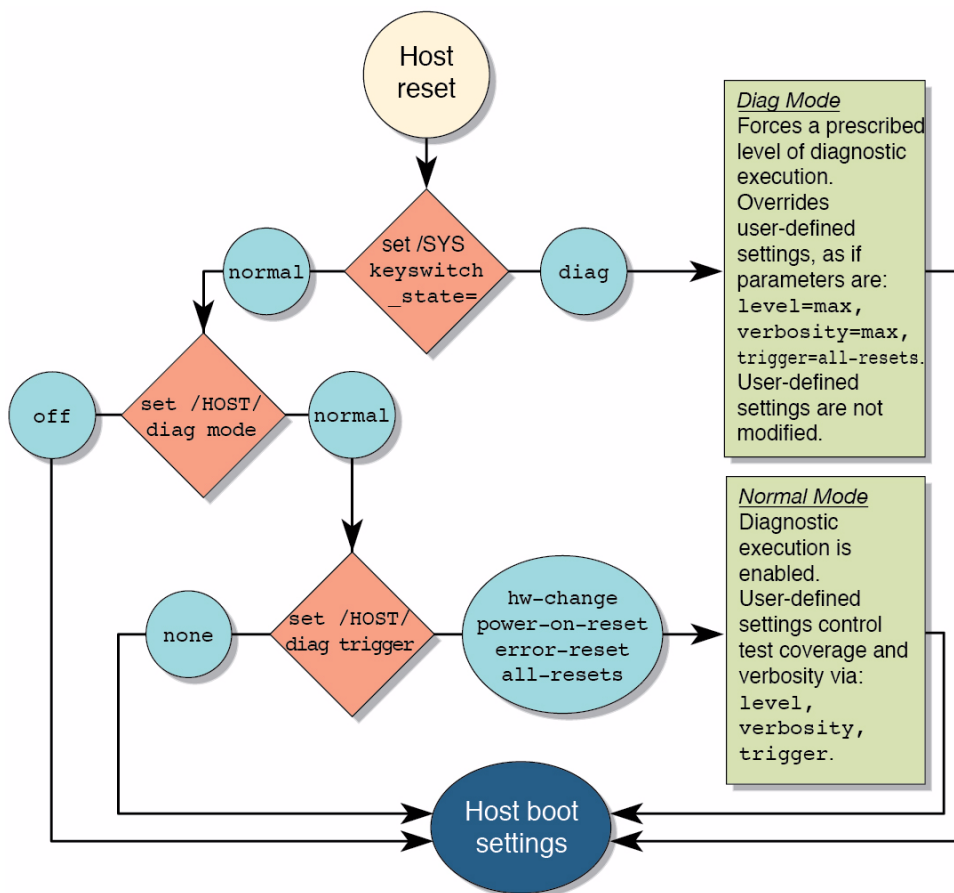
These Oracle ILOM properties determine how POST performs its operations. See also the flowchart that follows the table.

---

**Note** – The value of `keyswitch_state` must be `normal` when individual POST parameters are changed.

---

Parameter	Values	Description
/SYS keyswitch_state	normal	The host can power on and run POST (based on the other parameter settings). This parameter overrides all other commands.
	diag	The host runs POST based on predetermined settings that perform maximum verbose testing.
	standby	The host cannot power on.
	locked	The host can power on and run POST, but no flash updates can be made.
/HOST/diag mode	off	POST does not run.
	normal	Runs POST according to diag_level value.
	service	Runs POST with preset values for diag_level and diag_verbosity.
/HOST/diag_level	max	If diag_mode = normal, runs all the minimum tests plus extensive processor and memory tests.
	min	If diag_mode = normal, runs the minimum set of tests.
/HOST/diag_trigger	none	Does not run POST on reset.
	hw-change	(Default) Runs POST following an AC power cycle and when the top cover is removed.
	power-on-reset	Runs POST only for the first power on.
	error-reset	(Default) Runs POST if fatal errors are detected.
	all-resets	Runs POST after any reset.
/HOST/diag_verbosity	normal	POST output displays all test and informational messages.
	min	POST output displays functional tests with a banner and pinwheel.
	max	POST displays all test and informational messages, and some debugging messages.
	debug	POST displays extensive debugging output on the system console, including the devices being tested and the debug output of each test.
	none	No POST output is displayed.



The following table shows combinations of Oracle ILOM parameters and associated POST modes.

Oracle ILOM Parameter	Normal Diagnostic Mode (Default Settings)	No POST Execution	Service Mode Using the Keyswitch_state
keyswitch_state*	normal	normal	diag
/HOST/diag mode	normal	Off	
/HOST/diag level	max		

Oracle ILOM Parameter	Normal Diagnostic Mode (Default Settings)	No POST Execution	Service Mode Using the Keyswitch_state
/HOST/diag trigger	hw-change error-reset	none	
/HOST/diag verbosity	normal		
Description of POST execution	This is the default POST configuration. This configuration tests the server module thoroughly and suppresses some of the detailed POST output.	POST does not run, resulting in quick initialization. This configuration is not suggested.	POST runs the full spectrum of tests with the maximum output displayed.

\* The keyswitch\_state parameter, when set to diag, overrides all the other POST variables.

## Related Information

- [“POST Overview” on page 30](#)
- [“Configure POST” on page 33](#)
- [“Run POST With Maximum Testing” on page 35](#)
- [“Interpret POST Fault Messages” on page 37](#)
- [“Clear POST-Detected Faults” on page 37](#)
- [“POST Output Reference” on page 39](#)

## ▼ Configure POST

### 1. Log in to Oracle ILOM.

See [“Access the SP \(Oracle ILOM\)” on page 15](#).

### 2. Set the virtual keyswitch to the value that corresponds to the POST configuration you want to run.

The following example sets the virtual keyswitch to `normal`, which will configure POST to run according to other parameter values.

```
-> set /SYS keyswitch_state=normal
Set 'keyswitch_state' to 'Normal'
```

For possible values for the `keyswitch_state` parameter, see [“Oracle ILOM Properties That Affect POST Behavior” on page 30](#).

3. If the virtual keyswitch is set to normal, and you want to define the mode, level, verbosity, or trigger, set the respective parameters.

Syntax:

```
set /HOST/diag property=value
```

See “Oracle ILOM Properties That Affect POST Behavior” on page 30 for a list of parameters and values.

For examples:

```
-> set /HOST/diag mode=normal
```

or

```
-> set /HOST/diag verbosity=max
```

4. To see the current values for settings, use the show command.

For example, showing default values:

```
-> show /HOST/diag

/HOST/diag
  Targets:

  Properties:
    error_reset_level = max
    error_reset_verbosity = normal
    hw_change_level = max
    hw_change_verbosity = normal
    level = max
    mode = normal
    power_on_level = max
    power_on_verbosity = normal
    trigger = hw-change error-reset
    verbosity = normal

  Commands:
    cd
    set
    show

->
```

## Related Information

- “POST Overview” on page 30
- “Oracle ILOM Properties That Affect POST Behavior” on page 30



- “Run POST With Maximum Testing” on page 35
- “Interpret POST Fault Messages” on page 37
- “Clear POST-Detected Faults” on page 37

## ▼ Run POST With Maximum Testing

### 1. Access the Oracle ILOM prompt.

See “Access the SP (Oracle ILOM)” on page 15.

### 2. Set the virtual keyswitch to diag so that POST will run in service mode.

```
-> set /SYS/keyswitch_state=diag
Set 'keyswitch_state' to 'Diag'
```

### 3. Reset the server module so that POST runs.

There are several ways to initiate a reset. The following example shows a reset using commands that will power cycle the host.

```
-> stop /SYS
Are you sure you want to stop /SYS (y/n)? y
Stopping /SYS
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
Starting /SYS
```

---

**Note** – The server module takes about one minute to power off. Type the show /HOST command to determine when the host has been powered off. The console will display status=Powered Off.

---

### 4. Switch to the host console to view the POST output.

```
-> start /HOST/console
Are you sure you want to start /HOST/console (y/n)? y
```

The following example shows abridged POST output.

```
Serial console started. To stop, type #.
[CPU 0:0:0] NOTICE: Checking Flash File System
[CPU 0:0:0] NOTICE: Initializing TOD: 2011/08/30 00:38:11
[CPU 0:0:0] NOTICE: Loaded ASR status DB data. Ver. 2.
[CPU 0:0:0] WARNING: TPM not supported
```

```

[CPU 0:0:0] NOTICE: Serial#:
0000000000000000.000900802c1cf133
[CPU 0:0:0] NOTICE: Version:      003e003012030607
[CPU 0:0:0] NOTICE: T4 Revision: 1.2
[CPU 0:0:0] NOTICE: MCU0: Memory Capacity is 64GB
[CPU 0:0:0] NOTICE: MCU1: Memory Capacity is 64GB
[CPU 0:0:0] NOTICE: Usable strands: ffffffffffffffff
[CPU 0:0:0] NOTICE: System memory capacity is 128GB
[CPU 0:0:0] NOTICE: Clocks: CMP: 2848 MHz DRAM: 533 MHz (6.4 Gbps)
CL: 1466 MHz (8.8 Gbps)
[CPU 0:0:0] NOTICE: Initializing TSR Hoovers
[CPU 0:0:0] NOTICE: Initializing FSR Hoovers
[CPU 0:0:0] NOTICE: Initializing MCU 0 serdes
[CPU 0:0:0] NOTICE: Initializing MCU 1 serdes
[CPU 0:0:0] NOTICE: Updating Config Information for Guest Manager
<...>
<...>
2011-08-30 00:47:29.301 0:0:0>| NODE:PORT 0:1 | AST2200          |
Addr: f850.01000000 | BDF 16: 0:0 | VID-1a03 | DID-1150 | Width=01
G1 |
2011-08-30 00:47:29.351 0:0:0>| NODE:PORT 0:1 | AST2100 Display
| Addr: f850.01100000 | BDF 17: 0:0 | VID-1a03 | DID-2000 | Width=
00 G0 |
2011-08-30 00:47:31.388 0:0:0>          PCIE PROBE Node 0 port 1,
devices found = 12
2011-08-30 00:47:31.404 0:0:0>          PCIE PROBE devices found = 23
2011-08-30 00:47:31.439 0:0:0>End   : Probe PCI Devices
2011-08-30 00:47:31.452 0:0:0>Begin: Network Tests
2011-08-30 00:47:31.496 0:0:0>End   : Network Tests
2011-08-30 00:47:31.555 0:0:0>INFO:
2011-08-30 00:47:31.563 0:0:0>      POST Passed all devices.
2011-08-30 00:47:31.576 0:0:0>POST:      Return to Host Config.
[CPU 0:0:0] NOTICE: Reconfiguring System

```

## 5. If you receive POST error messages, learn how to interpret them.

See [“Interpret POST Fault Messages” on page 37](#).

### Related Information

- [“POST Overview” on page 30](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 30](#)
- [“Configure POST” on page 33](#)
- [“Interpret POST Fault Messages” on page 37](#)
- [“Clear POST-Detected Faults” on page 37](#)

## ▼ Interpret POST Fault Messages

1. **Run POST.**

See [“Run POST With Maximum Testing”](#) on page 35.

2. **View the output and watch for messages.**

See [“POST Output Reference”](#) on page 39.

3. **To obtain more information on faults, run the `show faulty` command.**

See [“Check for Faults \(show faulty Command\)”](#) on page 18.

### Related Information

- [“Clear POST-Detected Faults”](#) on page 37
- [“POST Overview”](#) on page 30
- [“Oracle ILOM Properties That Affect POST Behavior”](#) on page 30
- [“Diagnostics Overview”](#) on page 5
- [“Configure POST”](#) on page 33
- [“Run POST With Maximum Testing”](#) on page 35

## ▼ Clear POST-Detected Faults

Use this procedure if you suspect that a fault was not automatically cleared. This procedure describes how to identify a POST-detected fault and, if necessary, manually clear the fault.

In most cases, when POST detects a faulty component, POST logs the fault and automatically takes the failed component out of operation by placing the component in the ASR blacklist. See [“Managing Components \(ASR\)”](#) on page 45.

Usually, when a faulty component is replaced, the replacement is detected when the SP is reset or power cycled. The fault is automatically cleared.

1. **Replace the faulty FRU.**

2. **At the Oracle ILOM prompt, type the `show faulty` command to identify POST detected faults.**

POST-detected faults are distinguished from other kinds of faults by the text:  
Forced fail. No UUID number is reported. For example:

-> <b>show faulty</b>		
Target	Property	Value
-----+-----+-----		
/SP/faultmgmt/0	fru	/SYS/MB/CMP0/BOB1/CH0/D0

/SP/faultmgmt/0	timestamp	Dec 21 16:40:56
/SP/faultmgmt/0/ faults/0	timestamp	Dec 21 16:40:56
/SP/faultmgmt/0/ faults/0	sp_detected_fault	/SYS/MB/CMP0/BOB1/CH0/D0 Forced fail (POST)

**3. Take action based on the show faulty output.**

- No fault is reported – The server module cleared the fault and you do not need to manually clear the fault. Do not perform the subsequent steps.
- Fault reported – Go to [Step 4](#).

**4. Use the component\_state property of the component to clear the fault and remove the component from the ASR blacklist.**

Use the FRU name that was reported in the fault in [Step 2](#). For example:

```
-> set /SYS/MB/CMP0/BOB1/CH0/D0 component_state=Enabled
```

The fault is cleared and should not show up when you run the show faulty command. Additionally, the front panel Fault (Service Action Required) LED is no longer on.

**5. Reset the server module.**

You must reboot the server module for the component\_state property to take effect.

**6. At the Oracle ILOM prompt, type the show faulty command to verify that no faults are reported.**

For example:

```
-> show faulty
Target          | Property          | Value
-----+-----+-----
->
```

**Related Information**

- [“POST Overview” on page 30](#)
- [“Oracle ILOM Properties That Affect POST Behavior” on page 30](#)
- [“Configure POST” on page 33](#)
- [“Run POST With Maximum Testing” on page 35](#)
- [“Clear POST-Detected Faults” on page 37](#)

# POST Output Reference

POST error messages use the following syntax:

```
c:s > ERROR: TEST = failing-test
c:s > H/W under test = FRU
c:s > Repair Instructions: Replace items in order listed by H/W
under test above
c:s > MSG = test-error-message
c:s > END_ERROR
```

In this syntax, *c* = the core number, *s* = the strand number.

Warning messages use the following syntax:

```
WARNING: message
```

Informational messages use the following syntax:

```
INFO: message
```

In the following example, POST reports an uncorrectable memory error affecting DIMM locations /SYS/MB/CMP0/BOB0/CH0/D0 and /SYS/MB/CMP0/BOB1/CH0/D0. The error was detected by POST.

```
2011-07-03 18:44:13.359 0:7:2>Decode of Disrupting Error Status Reg
(DESR HW Corrected) bits 00300000.00000000
2011-07-03 18:44:13.517 0:7:2>          1    DESR_SOCSRE:      SOC
(non-local) sw_recoverable_error.
2011-07-03 18:44:13.638 0:7:2>          1    DESR_SOCHCCE:     SOC
(non-local) hw_corrected_and_cleared_error.
2011-07-03 18:44:13.773 0:7:2>
2011-07-03 18:44:13.836 0:7:2>Decode of NCU Error Status Reg bits
00000000.22000000
2011-07-03 18:44:13.958 0:7:2>          1    NESR_MCU1SRE:     MCU1 issued
a Software Recoverable Error Request
2011-07-03 18:44:14.095 0:7:2>          1    NESR_MCU1HCCE:     MCU1
issued a Hardware Corrected-and-Cleared Error Request
2011-07-03 18:44:14.248 0:7:2>
2011-07-03 18:44:14.296 0:7:2>Decode of Mem Error Status Reg Branch 1
bits 33044000.00000000
2011-07-03 18:44:14.427 0:7:2>          1    MEU 61      R/W1C Set to 1
on an UE if VEU = 1, or VEF = 1, or higher priority error in same cycle.
2011-07-03 18:44:14.614 0:7:2>          1    MEC 60      R/W1C Set to 1
on a CE if VEC = 1, or VEU = 1, or VEF = 1, or another error in same cycle.
2011-07-03 18:44:14.804 0:7:2>          1    VEU 57      R/W1C Set to 1
```

```

on an UE, if VEF = 0 and no fatal error is detected in same cycle.
2011-07-03 18:44:14.983 0:7:2>          1      VEC 56      R/W1C Set to 1
on a CE, if VEF = VEU = 0 and no fatal or UE is detected in same cycle.
2011-07-03 18:44:15.169 0:7:2>          1      DAU 50      R/W1C Set to 1
if the error was a DRAM access UE.
2011-07-03 18:44:15.304 0:7:2>          1      DAC 46      R/W1C Set to 1
if the error was a DRAM access CE.
2011-07-03 18:44:15.440 0:7:2>
2011-07-03 18:44:15.486 0:7:2>          DRAM Error Address Reg for Branch
1 = 00000034.8647d2e0
2011-07-03 18:44:15.614 0:7:2>          Physical Address is
00000005.d21bc0c0
2011-07-03 18:44:15.715 0:7:2>          DRAM Error Location Reg for Branch
1 = 00000000.00000800
2011-07-03 18:44:15.842 0:7:2>          DRAM Error Syndrome Reg for Branch
1 = dd1676ac.8c18c045
2011-07-03 18:44:15.967 0:7:2>          DRAM Error Retry Reg for Branch 1
= 00000000.00000004
2011-07-03 18:44:16.086 0:7:2>          DRAM Error RetrySyndrome 1 Reg for
Branch 1 = a8a5f81e.f6411b5a
2011-07-03 18:44:16.218 0:7:2>          DRAM Error Retry Syndrome 2 Reg
for Branch 1 = a8a5f81e.f6411b5a
2011-07-03 18:44:16.351 0:7:2>          DRAM Failover Location 0 for
Branch 1 = 00000000.00000000
2011-07-03 18:44:16.475 0:7:2>          DRAM Failover Location 1 for
Branch 1 = 00000000.00000000
2011-07-03 18:44:16.604 0:7:2>
2011-07-03 18:44:16.648 0:7:2>ERROR: POST terminated prematurely. Not
all system components tested.
2011-07-03 18:44:16.786 0:7:2>POST: Return to VBSC
2011-07-03 18:44:16.795 0:7:2>ERROR:
2011-07-03 18:44:16.839 0:7:2>      POST toplevel status has the following
failures:
2011-07-03 18:44:16.952 0:7:2>      Node 0 -----
2011-07-03 18:44:17.051 0:7:2>          /SYS/MB/CMP0/BOB0/CH1/D0
2011-07-03 18:44:17.145 0:7:2>          /SYS/MB/CMP0/BOB1/CH1/D0
2011-07-03 18:44:17.241 0:7:2>END_ERROR

```

## Related Information

- [“Oracle ILOM Properties That Affect POST Behavior” on page 30](#)
- [“Run POST With Maximum Testing” on page 35](#)
- [“Clear POST-Detected Faults” on page 37](#)

---

# Managing Faults (PSH)

These topics describe the PSH feature:

- [“PSH Overview” on page 41](#)
- [“Check for PSH-Detected Faults” on page 42](#)
- [“Clear PSH-Detected Faults” on page 44](#)

## Related Information

- [“Diagnostics Overview” on page 5](#)
- [“Diagnostics Process” on page 7](#)
- [“Managing Faults \(Oracle ILOM\)” on page 11](#)
- [“Interpreting Log Files and System Messages” on page 23](#)
- [“Managing Faults \(POST\)” on page 29](#)
- [“Managing Components \(ASR\)” on page 45](#)
- [“Checking if Oracle VTS Software Is Installed” on page 27](#)
- [“POST Overview” on page 30](#)

## PSH Overview

The Oracle Solaris PSH technology enables the server module to diagnose problems while the Oracle Solaris OS is running and to mitigate many problems before they negatively affect operations.

The Oracle Solaris OS uses the fault manager daemon, `fmd(1M)`, which starts at boot time and runs in the background to monitor the server module. If a component generates an error, the daemon correlates the error with data from previous errors and other relevant information to diagnose the problem. Once diagnosed, the fault manager daemon assigns a UUID to the error. This value distinguishes this error across any set of server modules.

When possible, the fault manager daemon initiates steps to self-heal the failed component and take the component offline. The daemon also logs the fault to the `syslogd` daemon and provides a fault notification with a message ID (sometimes labeled MSG-ID). You can use the message ID to get additional information about the problem from the knowledge article database.

The PSH technology covers the following server module components:

- CPU

- Memory
- I/O subsystem

The PSH console message provides the following information about each detected fault:

- Type
- Severity
- Description
- Automated response
- Impact
- Suggested action for a system administrator

If PSH detects a faulty component, use the `fmadm faulty` command to display information about the fault. Alternatively, you can use the Oracle ILOM command `show faulty` for the same purpose.

### Related Information

- [“Check for Faults \(show faulty Command\)” on page 18](#)
- [“Check for PSH-Detected Faults” on page 42](#)
- [“Clear PSH-Detected Faults” on page 44](#)

## ▼ Check for PSH-Detected Faults

The `fmadm faulty` command displays the list of faults detected by PSH. You can run this command either from the host or through the Oracle ILOM `fmadm` shell.

As an alternative, you can display fault information by running the Oracle ILOM command `show`.



## 1. Check the event log.

```
# fmadm faulty
TIME          EVENT-ID          MSG-ID          SEVERITY
Aug 13 11:48:33 21a8b59e-89ff-692a-c4bc-f4c5cccca8c8  SUN4V-8002-6E  Major

Platform      : sun4v          Chassis_id      :
Product_sn    :

Fault class    : fault.cpu.generic-sparc.strand
Affects        : cpu:///cpuid=**/serial=*****
                  faulted and taken out of service
FRU            : "/SYS/MB"
(hc:///product-id=****:product-sn=****:server-id=***-*****-****:
chassis-id=****:*****-*****:serial=****:revision=05/
chassis=0/motherboard=0)
                  faulty

Description    : The number of correctable errors associated with this strand has
                  exceeded acceptable levels.

Response       : The fault manager will attempt to remove the affected strand
                  from service.

Impact        : System performance may be affected.

Action        : Schedule a repair procedure to replace the affected resource, the
                  identity of which can be determined using 'fmadm faulty'.
```

In this example, a fault is displayed, indicating the following details:

- Date and time of the fault.
- EVENT-ID, which is unique for every fault  
(21a8b59e-89ff-692a-c4bc-f4c5cccca8c8).
- MSG-ID, which can be used to obtain additional fault information  
(SUN4V-8002-6E).
- Faulted FRU. The information provided in the example includes the part number of the FRU and the serial number of the FRU. The FRU field provides the name of the FRU (/SYS/MB for motherboard in this example).

## 2. Use the message ID to obtain more information about this type of fault.

- a. Obtain the message ID from console output or from the Oracle ILOM `show faulty` command.
- b. Sign into the Oracle support site, <http://support.oracle.com>.

- c. Select the Knowledge tab.
- d. Search for that message ID in the Knowledge Base.
- e. Follow the suggested actions to repair the fault.

### Related Information

- [“Clear PSH-Detected Faults” on page 44](#)

## ▼ Clear PSH-Detected Faults

When PSH detects faults, the faults are logged and displayed on the console. In most cases, after the fault is repaired, the server module detects the corrected state and repairs the fault condition automatically. However, you should verify this repair. In cases where the fault condition is not automatically cleared, you must clear the fault manually.

1. After replacing a faulty FRU, power on the server module.
2. At the host prompt, determine if the replaced FRU still shows a faulty state.

```
# fmadm faulty
TIME          EVENT-ID          MSG-ID          SEVERITY
Aug 13 11:48:33 21a8b59e-89ff-692a-c4bc-f4c5cccca8c8  SUN4V-8002-6E  Major

Platform      : sun4v          Chassis_id   :
Product_sn    :

Fault class   : fault.cpu.generic-sparc.strand
Affects       : cpu:///cpuid=**/serial=*****
                faulted and taken out of service
FRU           : "/SYS/MB"
(hc://:product-id=****:product-sn=*****:server-id=***-*****-****:
chassis-id=*****:*****-*****:serial=*****:revision=05/
chassis=0/motherboard=0)
                faulty

Description   : The number of correctable errors associated with this strand has
                exceeded acceptable levels.

Response      : The fault manager will attempt to remove the affected strand
                from service.

Impact        : System performance may be affected.
```

Action	: Schedule a repair procedure to replace the affected resource, the identity of which can be determined using 'fmadm faulty'.
--------	---

- If no fault is reported, you do not need to do anything else. Do not perform the subsequent steps.
- If a fault is reported, continue to [Step 3](#).

### 3. Clear the fault from all persistent fault records.

In some cases, even though the fault is cleared, some persistent fault information remains and results in erroneous fault messages at boot time. To ensure that these messages are not displayed, type the following Oracle Solaris command:

<pre># fmadm repair EVENT-ID</pre>
------------------------------------

For the EVENT-ID in the example shown in [Step 2](#), type:

<pre># fmadm repair 21a8b59e-89ff-692a-c4bc-f4c5cccca8c8</pre>
--

### 4. Use the Oracle ILOM `clear_fault_action` property of the FRU to clear the fault.

<pre>-&gt; set /SYS/MB clear_fault_action=True Are you sure you want to clear /SYS/MB (y/n)? y set 'clear_fault_action' to 'true'</pre>
---

### Related Information

- [“PSH Overview” on page 41](#)
- [“Clear PSH-Detected Faults” on page 44](#)

---

## Managing Components (ASR)

These topics explain the role played by ASR and how to manage the components that ASR controls.

- [“ASR Overview” on page 46](#)
- [“Display System Components” on page 47](#)
- [“Disable System Components” on page 48](#)
- [“Enable System Components” on page 49](#)

## Related Information

- “Diagnostics Overview” on page 5
- “Diagnostics Process” on page 7
- “Managing Faults (Oracle ILOM)” on page 11
- “Interpreting Log Files and System Messages” on page 23
- “Managing Faults (PSH)” on page 41
- “Managing Faults (POST)” on page 29
- “Checking if Oracle VTS Software Is Installed” on page 27

## ASR Overview

ASR enables the server module to automatically configure failed components out of operation until they can be replaced. In the server module, ASR manages the following components:

- CPU strands
- Memory DIMMs
- I/O subsystem

The database that contains the list of disabled components is the ASR blacklist (`asr-db`).

In most cases, POST automatically disables a faulty component. After the cause of the fault is repaired (FRU replacement, loose connector reseated, and so on), you might need to remove the component from the ASR blacklist.

The following ASR commands enable you to view, add, or remove components (`asrkeys`) from the ASR blacklist. You run these commands from the Oracle ILOM prompt.

Command	Description
<code>show components</code>	Displays system components and their current state.
<code>set <i>asrkey</i> component_state=Enabled</code>	Removes a component from the <code>asr-db</code> blacklist, where <i>asrkey</i> is the component to enable.
<code>set <i>asrkey</i> component_state=Disabled</code>	Adds a component to the <code>asr-db</code> blacklist, where <i>asrkey</i> is the component to disable.

---

**Note** – The `asrkey` values vary from system to system, depending on how many cores and memory are present. Use the `show components` command to see the `asrkey` values on a given system.

---

After you enable or disable a component, you must reset (or power cycle) the server module for the component's change of state to take effect. See the *Server Module Administration Guide*

### Related Information

- [“Display System Components” on page 47](#)
- [“Disable System Components” on page 48](#)
- [“Enable System Components” on page 49](#)

## ▼ Display System Components

The `show components` command displays the system components (`asrkeys`) and reports their status.

- **At the Oracle ILOM prompt, type** `show components`.

In the following example, one of the DIMMs (BOB1/CH0/D0) is shown as disabled.

```
->show components
```

Target	Property	Value
/SYS/MB/REM	component_state	Enabled
/SYS/MB/FEM0	component_state	Enabled
/SYS/MB/CMP0/L2T0	component_state	Enabled
/SYS/MB/CMP0/L2T1	component_state	Enabled
/SYS/MB/CMP0/L2T2	component_state	Enabled
/SYS/MB/CMP0/L2T3	component_state	Enabled
/SYS/MB/CMP0/L2T4	component_state	Enabled
/SYS/MB/CMP0/L2T5	component_state	Enabled
/SYS/MB/CMP0/L2T6	component_state	Enabled
/SYS/MB/CMP0/L2T7	component_state	Enabled
/SYS/MB/CMP0/CORE0/ P0	component_state	Enabled
/SYS/MB/CMP0/CORE0/ P1	component_state	Enabled
<...>		
<...>		

/SYS/MB/CMP0/MCU0	component_state	Enabled
/SYS/MB/CMP0/MCU1	component_state	Enabled
/SYS/MB/CMP0/NIU0	component_state	Enabled
/SYS/MB/CMP0/NIU1	component_state	Enabled
/SYS/MB/CMP0/ NIU_CORE	component_state	Enabled
/SYS/MB/CMP0/PEX	component_state	Enabled
/SYS/MB/CMP0/PEU0	component_state	Enabled
/SYS/MB/CMP0/PEU1	component_state	Enabled
/SYS/MB/CMP0/BOB0/ CH0/D0	component_state	Enabled
/SYS/MB/CMP0/BOB0/ CH1/D0	component_state	Enabled
/SYS/MB/CMP0/BOB1/ CH0/D0	component_state	Disabled
/SYS/MB/CMP0/BOB1/ CH1/D0	component_state	Enabled
/SYS/MB/CMP0/BOB2/ CH0/D0	component_state	Enabled
/SYS/MB/CMP0/BOB2/ CH1/D0	component_state	Enabled
/SYS/MB/CMP0/BOB3/ CH0/D0	component_state	Enabled
/SYS/MB/CMP0/BOB3/ CH1/D0	component_state	Enabled
/SYS/MB/GBE	component_state	Enabled
/SYS/MB/USB	component_state	Enabled
/SYS/MB/VIDEO	component_state	Enabled
/SYS/MB/PCI- SWITCH0	component_state	Enabled
/SYS/MB/PCI- SWITCH1	component_state	Enabled

->

### Related Information

- [“View System Message Log Files” on page 24](#)
- [“Disable System Components” on page 48](#)
- [“Enable System Components” on page 49](#)

## ▼ Disable System Components

You disable a component by setting its `component_state` property to `Disabled`. This action adds the component to the ASR blacklist.

1. At the Oracle ILOM prompt, set the `component_state` property to Disabled.

```
-> set /SYS/MB/CMP0/BOB1/CH0/D0 component_state=Disabled
```

2. Reset the server module so that the ASR command takes effect.

```
-> stop /SYS
Are you sure you want to stop /SYS (y/n)? y
Stopping /SYS
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
Starting /SYS
```

---

**Note** – In the Oracle ILOM shell, there is no notification when the system is actually powered off. Powering off takes about a minute. Use the `show /HOST` command to determine if the host has powered off.

---

### Related Information

- [“View System Message Log Files” on page 24](#)
- [“Display System Components” on page 47](#)
- [“Enable System Components” on page 49](#)

## ▼ Enable System Components

You enable a component by setting its `component_state` property to Enabled. This action removes the component from the ASR blacklist.

1. At the Oracle ILOM prompt, set the `component_state` property to Enabled.

```
-> set /SYS/MB/CMP0/BOB1/CH0/D0 component_state=Enabled
```

2. Reset the server module so that the ASR command takes effect.

```
-> stop /SYS
Are you sure you want to stop /SYS (y/n)? y
Stopping /SYS
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
Starting /SYS
```

---

**Note** – In the Oracle ILOM shell, there is no notification when the system is actually powered off. Powering off takes about a minute. Use the `show /HOST` command to determine if the host has powered off.

---

### **Related Information**

- [“View System Message Log Files” on page 24](#)
- [“Display System Components” on page 47](#)
- [“Disable System Components” on page 48](#)



# Preparing for Service

The following topics describe how to prepare the server module for servicing.

Step	Description	Links
1.	Review the safety and handling information.	<a href="#">“Safety Information” on page 51</a> <a href="#">“Handling Precautions” on page 53</a>
2.	Gather the tools for service.	<a href="#">“Tools Needed for Service” on page 54</a>
3.	find serial numbers for the modular system and the server module.	<a href="#">“Find the Modular System Chassis Serial Number” on page 54</a> <a href="#">“Find the Server Module Serial Number” on page 55</a>
4.	Identify the server module that you want to service.	<a href="#">“Locate the Server Module” on page 56</a>
5.	Shut down the OS and host, and place the server module in a ready-to-remove state.	<a href="#">“Preparing the Server Module for Removal” on page 56</a>
6.	Remove the server module from the modular system chassis.	<a href="#">“Remove the Server Module From the Modular System” on page 61</a>
7.	Remove the server module cover.	<a href="#">“Remove the Cover” on page 63</a>

## Related Information

- [“Returning the Server Module to Operation” on page 119](#)

---

## Safety Information

For your protection, observe the following safety precautions when setting up your equipment:

- Follow all cautions and instructions marked on the equipment.
- Follow all cautions and instructions described in the documentation that shipped with your server module and in the *SPARC T4-1B Server Module Safety and Compliance Guide*.
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label.
- Follow the ESD safety practices as described in this section.

## Safety Symbols

You will see the following symbols in various places in the server module documentation. Note the explanations provided next to each symbol.



---

**Caution** – There is a risk of personal injury or equipment damage. To avoid personal injury and equipment damage, follow the instructions.

---

---

**Caution** – Components inside the server module might be hot. Use caution when servicing components inside the server module.

---



---

**Caution** – **Hazardous voltages are present.** To reduce the risk of electric shock and danger to personal health, follow the instructions.

---

## ESD Measures

ESD sensitive devices, such as the motherboard, cards, drives, and DIMMs require special handling.



---

**Caution** – Circuit boards and drives contain electronic components that are extremely sensitive to static electricity. Ordinary amounts of static electricity from clothing or the work environment can destroy the components located on these boards. Do not touch the components along their connector edges.

---

## Antistatic Wrist Strap Use

Wear an antistatic wrist strap and use an antistatic mat when handling components such as drive assemblies, circuit boards, or PCI cards. When servicing or removing server module components, attach an antistatic strap to your wrist and then to a metal area on the chassis. Following this practice equalizes the electrical potentials between you and the server module.

## Antistatic Mat

Place ESD-sensitive components such as cards and DIMMs on an antistatic mat.

### Related Information

- [“Handling Precautions” on page 53](#)
- [“Tools Needed for Service” on page 54](#)

---

## Handling Precautions

Review the following cautions.



---

**Caution** – A server module can weigh as much as 20 pounds (9.0 kg). During removal, hold the server module firmly with both hands.

---



---

**Caution** – Do not stack server modules higher than five units tall.

---



---

**Caution** – Insert a filler panel into the empty server module slot within 60 seconds after removing a server module ensure proper modular system chassis cooling.

---

### Related Information

- [“Safety Information” on page 51](#)
- [“Tools Needed for Service” on page 54](#)

---

# Tools Needed for Service

The following tools are required for service procedures:

- Antistatic wrist strap
- Antistatic mat
- Stylus or pencil (to operate the power button)
- UCP-3 dongle (UCP-4 dongle can be used, but refer to instructions in the *Server Module Installation Guide*)
- Blade filler panel

## Related Information

- [“Safety Information” on page 51](#)
- [“Handling Precautions” on page 53](#)
- [“Find the Modular System Chassis Serial Number” on page 54](#)

---

## ▼ Find the Modular System Chassis Serial Number

To obtain support for your server module, you need the serial number of the Sun Blade 6000 modular system in which the server module is located, not the serial number of the server module. The serial number of the modular system is provided on a label on the upper left edge of the front bezel.

Use the following procedure to obtain the serial number remotely.

**1. Log in to the CMM of the modular system.**

See the documentation for the Sun Blade 6000 modular system.

**2. Type.**

```
-> show /CH
```

**3. In the output, locate the value for `product_serial_number`.**

That number is the serial number of the modular system.

## Related Information

- [“Find the Server Module Serial Number” on page 55](#)
- [“Locate the Server Module” on page 56](#)

---

# ▼ Find the Server Module Serial Number

---

**Note** – To obtain support for your server module, you need the serial number of the Sun Blade 6000 modular system in which the server module is located, not the serial number of the server module. See [“Find the Modular System Chassis Serial Number” on page 54](#).

---

The serial number of the server module is located on a sticker on the RFID tag that is mounted in the center of the front panel. However, this label is not present on a server module that has been moved into a new enclosure assembly. You also can type the Oracle ILOM `show /SYS` command to display the number.

- **Access the Oracle ILOM CLI and type.**

```
-> show /SYS

/SYS
  Targets:
    MB
    MB_ENV
    HDD0
    <...>
    <...>
  Properties:
    type = Host System
    ipmi_name = /SYS
    keyswitch_state = Normal
    product_name = SPARC T4-1B
    product_part_number = T4-1B-AT02-P10A
    product_serial_number = 1129NN1083    <---
    product_manufacturer = Oracle Corporation
    fault_state = OK
    clear_fault_action = (none)
    prepare_to_remove_status = NotReady
    prepare_to_remove_action = (none)
    return_to_service_action = (none)
    power_state = On
```

### Related Information

- [“Locate the Server Module” on page 56](#)
- [“Find the Modular System Chassis Serial Number” on page 54](#)

---

## ▼ Locate the Server Module

To identify a specific server module from others in the modular system, perform the following steps.

1. **Log in to Oracle ILOM on the server module you plan to locate.**
2. **Type.**

```
-> set /SYS/LOCATE value=fast_blink
```

The Locator LED on the server module blinks.

3. **Identify the server module with a blinking white LED.**
4. **Once you locate the server module, press the Locator LED to turn it off.**

---

**Note** – Alternatively, you can turn off the Locator LED by typing the Oracle ILOM `set /SYS/LOCATE value=off` command.

---

### Related Information

- [“Remove the Server Module From the Modular System” on page 61](#)

---

## Preparing the Server Module for Removal

There are several ways to shut down the server module before you remove it from the chassis.

Description	Links
Perform a graceful shutdown using commands.	<a href="#">“Shut Down the OS and Host (Commands)” on page 57</a> <a href="#">“Set the Server Module to a Ready-to-Remove State” on page 60</a>
Perform a graceful shutdown using the power button and commands.	<a href="#">“Shut Down the OS and Host (Power Button – Graceful)” on page 59</a> <a href="#">“Set the Server Module to a Ready-to-Remove State” on page 60</a>
Perform a nongraceful shutdown (last resort or emergency situations).	<a href="#">“Shut Down the OS and Host (Emergency Shutdown)” on page 59</a> <a href="#">“Set the Server Module to a Ready-to-Remove State” on page 60</a>

## Related Information

- [“Remove the Server Module From the Modular System” on page 61](#)

## ▼ Shut Down the OS and Host (Commands)

This topic describes one method for shutting down the Oracle Solaris OS. For information on other ways to shut down the Oracle Solaris OS, refer to the Oracle Solaris OS documentation.

### 1. Log in as superuser or equivalent.

Depending on the type of problem, you might want to view server module status or log files. You also might want to run diagnostics before you shut down the server module.

### 2. Notify affected users that the server module will be shut down.

Refer to the Oracle Solaris system administration documentation for additional information.

### 3. Save any open files and quit all running programs.

Refer to the application documentation for specific information on these processes.

### 4. (If applicable) Shut down all logical domains.

Refer to the Oracle Solaris system administration and Oracle VM Manager for SPARC documentation for additional information.

**5. Shut down the Oracle Solaris OS and reach the ok prompt.**

Refer to the Oracle Solaris system administration documentation for additional information.

The following example uses the Oracle Solaris shutdown command:

```
# shutdown -g0 -i0 -y

Shutdown started.      Tue Jun 28 13:06:20 PDT 2011

Changing to init state 0 - please wait
Broadcast Message from root (console) on server1 Tue Jun 28
13:06:20...
THE SYSTEM server1 IS BEING SHUT DOWN NOW ! ! !
Log off now or risk your files being damaged
# svc.startd: The system is coming down. Please wait.
svc.startd: 100 system services are now being stopped.
Jun 28 13:06:34 dt90-366 syslogd: going down on signal 15
svc.startd: The system is down.
syncing file systems... done
Program terminated

SPARC T4-1B, No Keyboard
OpenBoot 4.30, 16256 MB memory available, Serial # 87305111.
Ethernet address 0:21:28:34:2b:90, Host ID: 85342b90.
{0} ok
```

**6. Switch from the host console to the Oracle ILOM prompt by typing the #. (Hash Period) key sequence.**

**7. At the Oracle ILOM prompt, type.**

```
-> stop /SYS
```

**8. Prepare the server module for removal.**

See [“Set the Server Module to a Ready-to-Remove State”](#) on page 60.

**Related Information**

- [“Shut Down the OS and Host \(Power Button – Graceful\)”](#) on page 59
- [“Shut Down the OS and Host \(Emergency Shutdown\)”](#) on page 59
- [“Set the Server Module to a Ready-to-Remove State”](#) on page 60



## ▼ Shut Down the OS and Host (Power Button – Graceful)

This procedure gracefully shuts down the OS and places the server module in the power standby mode. In this mode, the Power OK LED blinks rapidly.

- **Press and release the recessed Power button.**

Use a stylus or the tip of a pen to operate this button. See [“Front and Rear Panel Components” on page 3](#).

---

**Note** – This button is recessed to prevent accidental server module power-off. Use the tip of a pen or other stylus to operate this button.

---

### Related Information

- [“Shut Down the OS and Host \(Commands\)” on page 57](#)
- [“Shut Down the OS and Host \(Emergency Shutdown\)” on page 59](#)
- [“Set the Server Module to a Ready-to-Remove State” on page 60](#)

## ▼ Shut Down the OS and Host (Emergency Shutdown)



---

**Caution** – All applications and files will be closed abruptly without saving changes. File system corruption might occur.

---

- **Press and hold the Power button for four seconds.**

Use a stylus or the tip of a pen to operate this button. See [“Front and Rear Panel Components” on page 3](#).

### Related Information

- [“Shut Down the OS and Host \(Commands\)” on page 57](#)
- [“Shut Down the OS and Host \(Power Button – Graceful\)” on page 59](#)
- [“Set the Server Module to a Ready-to-Remove State” on page 60](#)

## ▼ Set the Server Module to a Ready-to-Remove State

1. Log in to Oracle ILOM on the server module you plan to remove.
2. Ensure that the server module is in standby mode, with the host powered off.

```
-> show /SYS/ power_state

/SYS
properties:
power_state = Off
```

If you do not see this message, check that you have performed all the steps in [“Shut Down the OS and Host \(Commands\)” on page 57](#).

3. Type:

```
-> set /SYS/ prepare_to_remove_action=true
Set 'prepare_to_remove_action' to 'true'
```

The server module is in standby mode. Power is removed from the host while standby power is applied to the SP.

4. Confirm that the server module is in standby mode by viewing the blue Ready to Remove LED on the front of the server module.

See [“Front and Rear Panel Components” on page 3](#) to locate this LED. If the Ready to Remove LED is on, the server module is ready for removal from the modular system chassis.

5. Remove the server module from the chassis.

See [“Remove the Server Module From the Modular System” on page 61](#).

### Related Information

- [“Remove the Server Module From the Modular System” on page 61](#)
- [“Shut Down the OS and Host \(Commands\)” on page 57](#)
- [“Shut Down the OS and Host \(Power Button – Graceful\)” on page 59](#)
- [“Shut Down the OS and Host \(Emergency Shutdown\)” on page 59](#)

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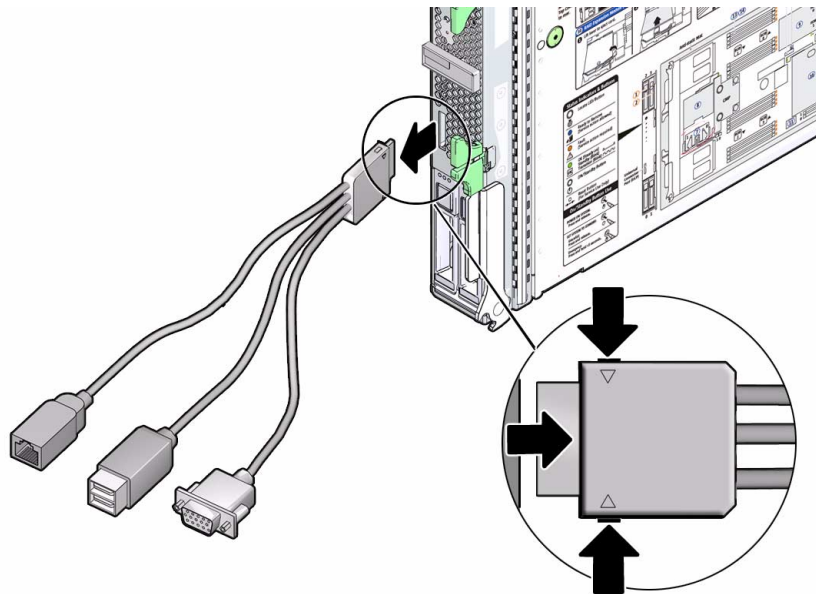
## ▼ Remove the Server Module From the Modular System

1. Review the safety and handling precautions.

See [“Safety Information” on page 51](#) and [“Handling Precautions” on page 53](#).

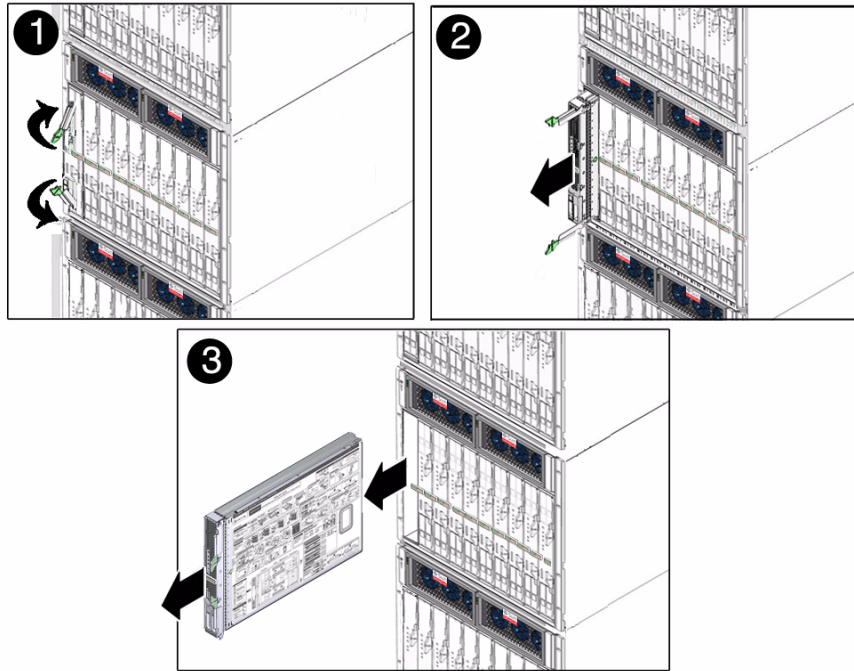
2. If a cable is connected to the front of the server module, disconnect it.

Press the buttons on either side of the UCP to release the connector.



3. Open both ejector arms (panel 1).

Squeeze both latches on each of the two ejector arms.



4. Pull the server module out (panel 2 and panel 3).
5. Close the ejector arms.
6. Remove the server module from the modular system (panel 3).  
Lift the server module with two hands.
7. Place the server module on an antistatic mat or surface.
8. Insert a filler panel into the empty chassis slot.

---

**Note** – When the modular system is operating, you must fill every slot with a filler panel or a server module within 60 seconds.

---

9. Remove the server module cover.  
See [“Remove the Cover”](#) on page 63.

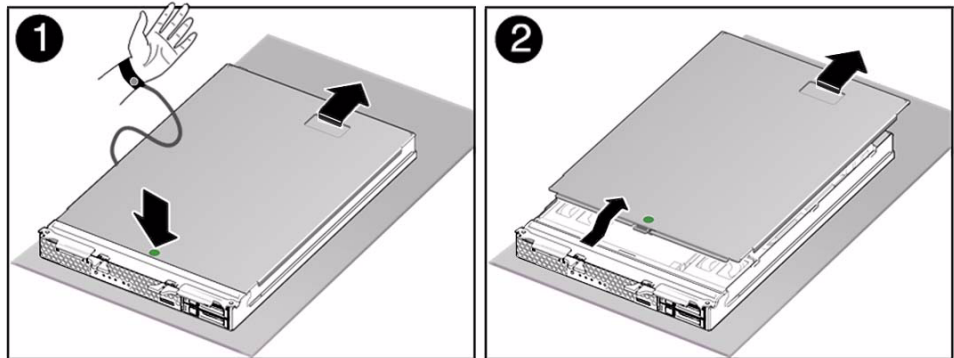
#### **Related Information**

- [“Remove the Cover”](#) on page 63
- [“Install the Server Module Into the Modular System”](#) on page 120

---

## ▼ Remove the Cover

1. (If needed) Remove the server module from the modular system.  
See [“Remove the Server Module From the Modular System”](#) on page 61.
2. Attach an antistatic strap to your wrist and then to a metal area on the server module.
3. While pressing the cover release button, slide the cover toward the rear of the server module about half an inch (1 cm).



4. Lift the cover off the server module chassis.
5. Service the faulty component.  
See [“Illustrated Parts Breakdown”](#) on page 1.

### Related Information

- [“Illustrated Parts Breakdown”](#) on page 1
- [“Replace the Cover”](#) on page 119



# Servicing Drives

The following topics apply to hard drives and solid state drives installed in the front slots of the server module.

**Note** – The term *drive* applies to either a hard drive or a solid state drive.

Description	Links
Replace a faulty drive.	<a href="#">“Drive Hot-Plugging Guidelines” on page 68</a> <a href="#">“Drive Configuration” on page 66</a> <a href="#">“Locate a Faulty Drive” on page 68</a> <a href="#">“Remove a Drive” on page 69</a> <a href="#">“Install a Drive” on page 71</a> <a href="#">“Verify Drive Functionality” on page 74</a>
Add an additional drive.	<a href="#">“Drive Configuration” on page 66</a> <a href="#">“Remove a Drive Filler” on page 70</a> <a href="#">“Install a Drive” on page 71</a> <a href="#">“Verify Drive Functionality” on page 74</a>
Remove a drive without replacing it.	<a href="#">“Drive Configuration” on page 66</a> <a href="#">“Locate a Faulty Drive” on page 68</a> <a href="#">“Install a Drive Filler” on page 73</a>
Identify drive LEDs.	<a href="#">“Drive LEDs” on page 67</a>

## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

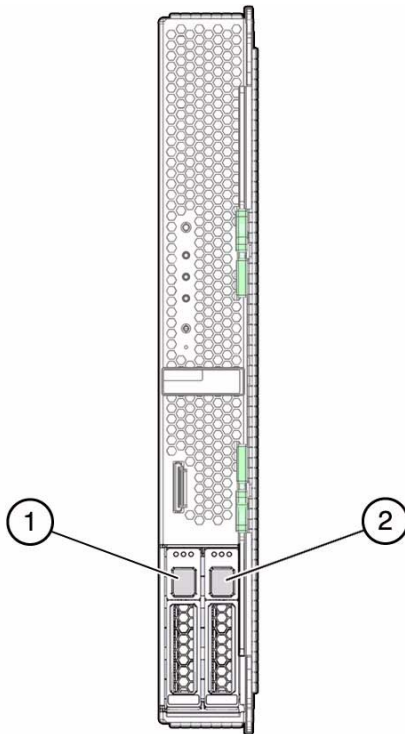
# Drive Configuration

The following figure and table describe the physical addresses assigned to the drives installed when the drive is installed into a particular slot.

---

**Note** – The Oracle Solaris OS now uses the *WWN* syntax in place of the unique *tn* (target ID) field in logical device names. This change affects how a target storage device is identified. Refer to the *Server Module Product Notes* for details.

---



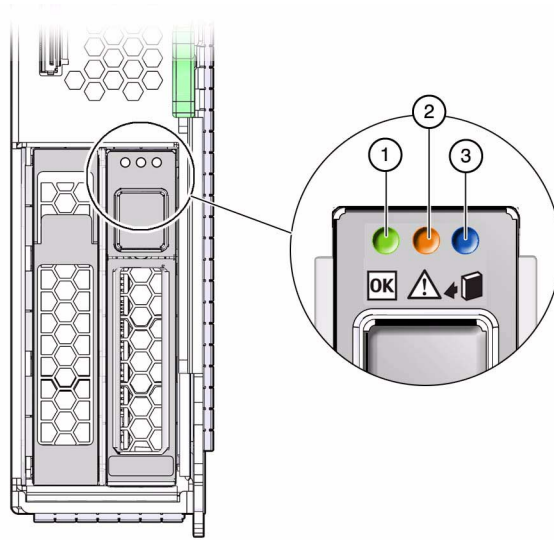
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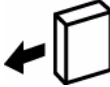
No.	Description
1	Drive slot 0
2	Drive slot 1

---



# Drive LEDs



No.	LED or Button	Color	Icon	Description
1	Drive OK/Activity LED	Green		Indicates the following drive status: <ul style="list-style-type: none"> <li>• On – Drive is idle and available for use.</li> <li>• Off – Read or write activity is in progress.</li> </ul>
3	Drive Service Action Required LED	Amber		Indicates that the drive has experienced a fault condition.
2	Drive Ready to Remove LED	Blue		Indicates that a drive can be removed during a hot-plug operation.

---

# Drive Hot-Plugging Guidelines

To safely remove a drive, you must:

- Prevent any applications from accessing the drive.
- Remove the logical software links.

Drives cannot be hot-plugged if:

- The drive provides the operating system, and the operating system is not mirrored on another drive.
- The drive cannot be logically isolated from the online operations of the server module.

If your drive falls into these conditions, you must shut down the Oracle Solaris OS before you replace the drive. See [“Shut Down the OS and Host \(Commands\)”](#) on page 57.

## Related Information

- [“Remove a Drive”](#) on page 69
- [“Install a Drive”](#) on page 71

---

## ▼ Locate a Faulty Drive

This procedure describes how to identify a faulty drive using the fault LEDs on the drive.

You can also use the `diskinfo(1M)` command to identify the slot in which a particular drive is installed. Refer to the *Server Module Administration Guide* and to the *Server Module Product Notes* for more information.

- **View the drive LEDs to determine the status of the drive.**

When the amber drive Service Required LED on the front of a drive is lit, a fault has occurred on that drive.

See [“Drive LEDs”](#) on page 67.

## Related Information

- [“Detecting and Managing Faults”](#) on page 5
- [“Remove a Drive”](#) on page 69

- [“Install a Drive” on page 71](#)

---

## ▼ Remove a Drive

1. **Identify the drive you plan to remove.**

See [“Locate a Faulty Drive” on page 68](#).

2. **Prepare the drive for removal by performing one of the following steps:**

- Take the drive offline.

The exact commands required to take the drive offline depend on the configuration of your drives. For example, you might need to unmount file systems or perform certain RAID commands.

One command that is commonly used to take a drive offline is the `cfgadm` command. For more information, refer to the Oracle Solaris `cfgadm` man page.

- Shut down the Oracle Solaris OS.

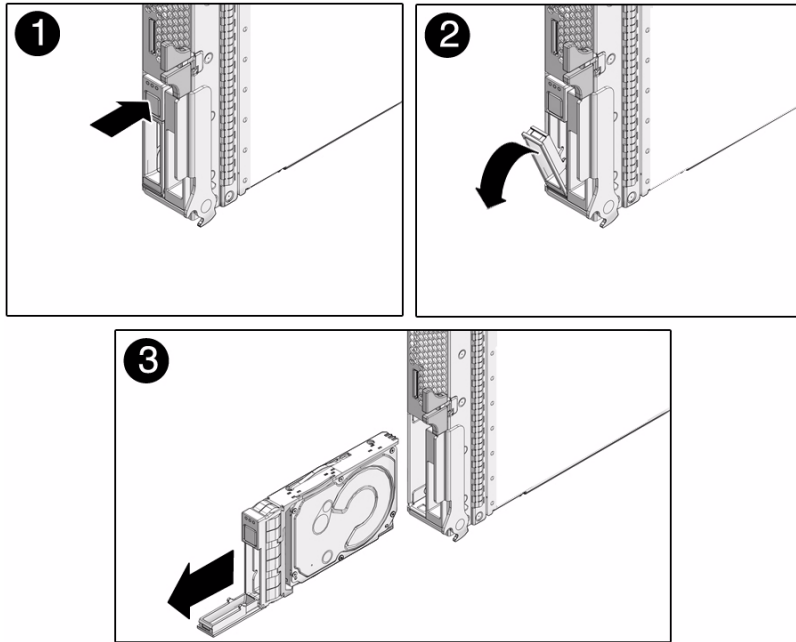
If the drive cannot be taken offline, shut down the Oracle Solaris OS on the server module. See [“Shut Down the OS and Host \(Commands\)” on page 57](#)

3. **Verify whether the blue Drive Ready to Remove LED is illuminated on the front of the drive.**

See [“Drive LEDs” on page 67](#). The blue LED will be illuminated only if the drive was taken offline using `cfgadm` or an equivalent command. The LED will not be illuminated if Oracle Solaris was shut down.

4. **Remove the drive.**

- a. **Push the latch release button on the drive (panels 1 and 2).**



b. Grasp the latch and pull the drive out of the drive slot (panel 3).

5. Consider your next step.

- If you are replacing the drive, see [“Install a Drive” on page 71](#).
- If you are not replacing the drive, install a drive filler. See [“Install a Drive Filler” on page 73](#).

**Related Information**

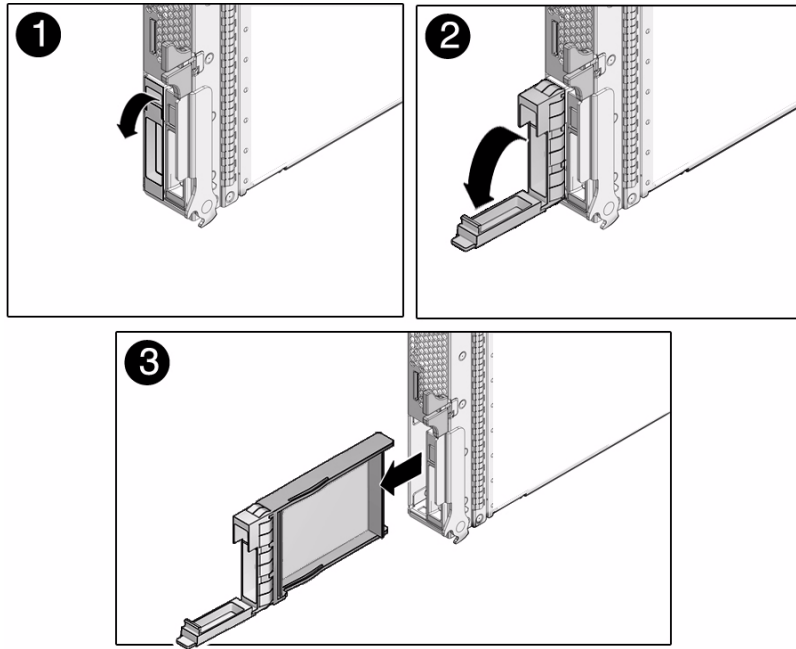
- [“Install a Drive Filler” on page 73](#)
- [“Install a Drive” on page 71](#)

---

## ▼ Remove a Drive Filler

All drive bays must be populated by either a drive or a filler.

1. Open the filler lever (panels 1 and 2).



2. Pull to remove the filler (panel 3).
3. Install a drive in this slot.  
See [“Install a Drive” on page 71](#).

#### Related Information

- [“Install a Drive” on page 71](#)
- [“Install a Drive Filler” on page 73](#)

---

## ▼ Install a Drive

The physical address of a drive is based the slot in which it is installed. See [“Drive Configuration” on page 66](#).

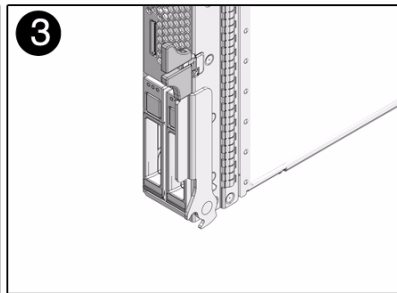
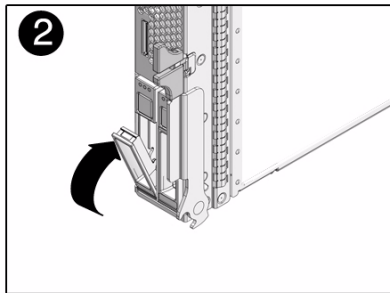
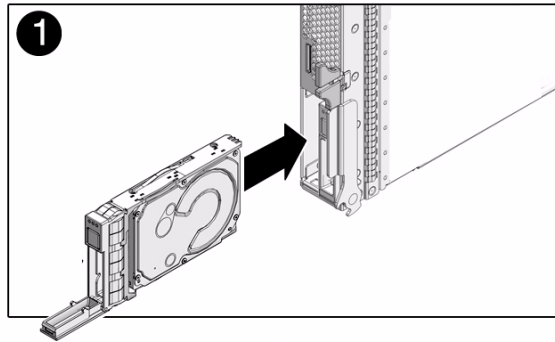
1. (If needed) Remove a drive.  
See [“Remove a Drive” on page 69](#).
2. Identify the slot in which to install the drive.

- If you are replacing a drive, ensure that you install the replacement drive in the same slot as the drive you removed.
- If you are adding an additional drive, install the drive in the next available drive slot.

**3. (If needed) Remove the drive filler from this slot.**

See [“Remove a Drive Filler”](#) on page 70.

**4. Slide the drive into the bay until it is fully seated (panel 1).**



**5. Close the latch to lock the drive in place (panels 2 and 3).**

**6. Verify the functionality of the new drive.**

See [“Verify Drive Functionality”](#) on page 74.

**Related Information**

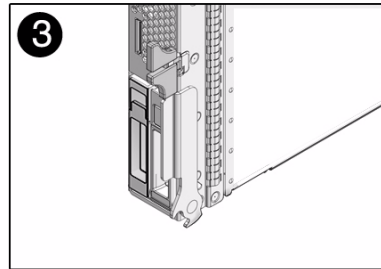
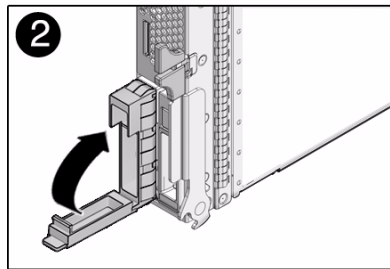
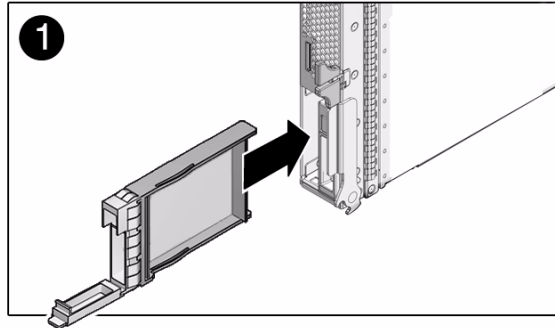
- [“Remove a Drive”](#) on page 69

---

## ▼ Install a Drive Filler

All drive bays must be populated by either a drive or a filler.

1. Extend the filler handle, then align the filler to the empty drive bay (panel 1).



2. Push the filler into place.
3. Close the filler lever (panels 2 and 3).

### Related Information

- [“Remove a Drive” on page 69](#)
- [“Remove a Drive Filler” on page 70](#)

---

## ▼ Verify Drive Functionality

1. **If the OS is shut down, and the drive you replaced was not the boot device, boot the OS.**

Depending on the nature of the replaced drive, you might need to perform administrative tasks to reinstall software before the server can boot. Refer to the Oracle Solaris OS administration documentation for more information.

2. **Verify that the drive's blue Ready to Remove LED is no longer lit on the drive that you installed.**

See ["Drive LEDs" on page 67](#).

If the fault LED is not illuminated, the drive is ready to be configured according to your requirements. Go to [Step 3](#).

If the fault LED is lit, see ["Detecting and Managing Faults" on page 5](#).

3. **Perform administrative tasks to reconfigure the drive.**

The procedures that you perform at this point depend on how your data is configured. You might need to partition the drive, create file systems, load data from backups, or have data updated from a RAID configuration.

The following commands might apply to your circumstances:

- You can use the Oracle Solaris command `cfgadm -al` to list all drives in the device tree, including unconfigured drives.
- If the drive is not in the list, such as with a newly installed drive, you can use `devfsadm` to configure it into the tree. See the `devfsadm` man page for details.

### Related Information

- ["Detecting and Managing Faults" on page 5](#)
- ["Locate a Faulty Drive" on page 68](#)
- ["Remove a Drive" on page 69](#)
- ["Install a Drive" on page 71](#)



# Servicing Memory

Use these topics to service the server module memory.

Description	Links
Understand memory faults.	<a href="#">“Memory Faults” on page 75</a>
Replace a faulty DIMM.	<a href="#">“DIMM Handling Precautions” on page 80</a> <a href="#">“Locate a Faulty DIMM” on page 80</a> <a href="#">“Remove a DIMM” on page 81</a> <a href="#">“Install a DIMM” on page 82</a> <a href="#">“Clear the Fault and Verify the Functionality of the Replacement DIMM” on page 84</a>
Add memory to the server module.	<a href="#">“DIMM Locations” on page 77</a> <a href="#">“DIMM Configuration Guidelines” on page 79</a> <a href="#">“DIMM Handling Precautions” on page 80</a> <a href="#">“Install a DIMM” on page 82</a> <a href="#">“Verify DIMM Functionality” on page 87</a>

## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

# Memory Faults

A variety of features play a role in how the memory subsystem is configured and how memory faults are handled. Understanding the underlying features helps you identify and repair memory problems. This topic describes how the server module deals with memory faults.

The following server module features independently manage memory faults:

- **POST** – Based on Oracle ILOM configuration variables, POST runs when the server module is powered on.

For correctable memory errors (sometimes called CEs), POST forwards the error to the Oracle Solaris PSH daemon for error handling.

If an incorrect memory fault is detected, POST displays the fault with the device name of the faulty DIMMs, and logs the fault. POST then disables the faulty DIMMs. Depending on the memory configuration and the location of the faulty DIMM, POST disables half of physical memory in the server module, or half the physical memory and half the processor threads. When the offlining process occurs in normal operation, you must replace the faulty DIMMs based on the fault message and then enable the disabled DIMMs. See [“Clear the Fault and Verify the Functionality of the Replacement DIMM” on page 84](#).

- **PSH** – A feature of the Oracle Solaris OS, PSH uses the fault manager daemon (`fmd`) to watch for various kinds of faults. When a fault occurs, the fault is assigned a UUID and logged. PSH reports the fault and suggests a replacement for the DIMMs associated with the fault.

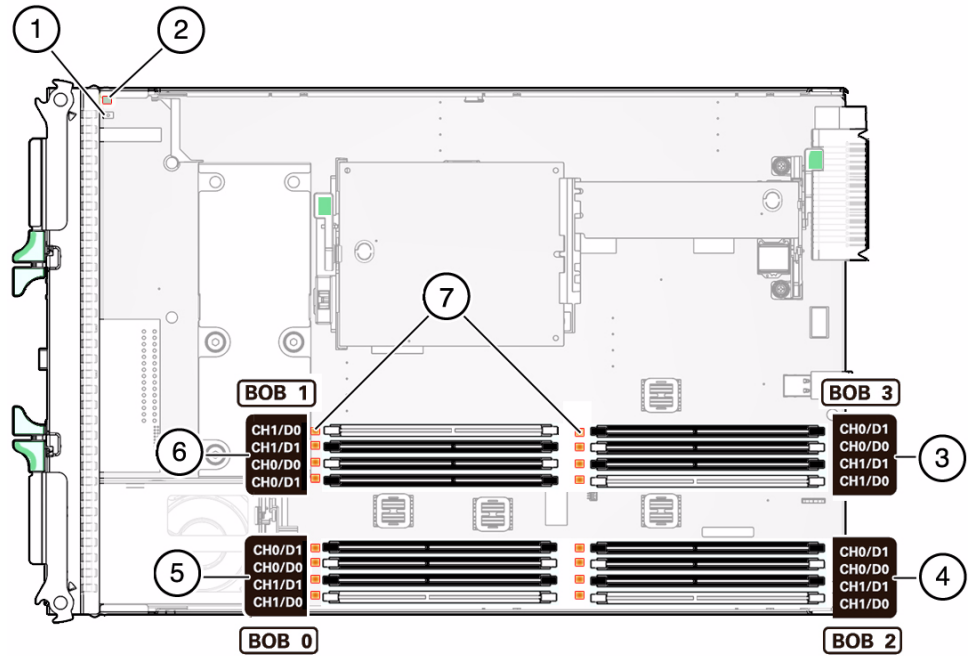
If you suspect that the server module has a memory problem, follow the [“Diagnostics Process” on page 7](#). The flowchart helps you determine if the memory problem was detected by POST or by PSH.

Once you identify which DIMMs you want to replace, see [“Locate a Faulty DIMM” on page 80](#). After replacing a faulty DIMM, you must perform the instructions in [“Clear the Fault and Verify the Functionality of the Replacement DIMM” on page 84](#).

### Related Information

- [“Locate a Faulty DIMM” on page 80](#)
- [“Clear the Fault and Verify the Functionality of the Replacement DIMM” on page 84](#)
- [“Clear the Fault and Verify the Functionality of the Replacement DIMM” on page 84](#)
- [“Detecting and Managing Faults” on page 5](#)

# DIMM Locations



No.	Description or Partial FRU Name (full names start with /SYS/MB/CMP0/)
1	Fault Remind button
2	Fault Remind Power LED
3	DIMMs controlled by BOB3: CH0 /D1 CH0 /D0 CH1 /D1 CH1 /D0
4	DIMMs controlled by BOB4: CH0 /D1 CH0 /D0 CH1 /D1 CH1 /D0

No.	Description or Partial FRU Name (full names start with /SYS/MB/CMP0/)
5	DIMMs controlled by BOB0: CH0/D1 CH0/D0 CH1/D1 CH1/D0
6	DIMMs controlled by BOB1: CH1/D0 CH1/D1 CH0/D0 CH0/D1
7	DIMM Fault LEDs

### Related Information

- [“DIMM Configuration Guidelines” on page 79](#)
- [“Memory Faults” on page 75](#)
- [“Locate a Faulty DIMM” on page 80](#)
- [“Remove a DIMM” on page 81](#)
- [“Install a DIMM” on page 82](#)
- [“Clear the Fault and Verify the Functionality of the Replacement DIMM” on page 84](#)

---

# DIMM Configuration Guidelines

Use these guidelines when installing, upgrading, or replacing DIMMs:

- Use only supported industry-standard DDR-3 DIMMs of these capacities:
  - 4 GBytes
  - 8 GBytes
  - 16 GBytes (quad rank)
  - 16 GBytes (dual rank) – requires system firmware 8.2.1.b or later.
  - 32 GBytes – requires system firmware 8.2.1.b or later

Refer to the *SPARC T4-1B Server Module Product Notes* for possible updates to supported capacities.

- Install quantities of 4, 8, or 16 DIMMs, in the correct slots:
  - 4 DIMMs: CH1/D0 slots (white sockets)
  - 8 DIMMs: CH1/D0 and CH0/D0 slots
  - 16 DIMMs: All slots
- All installed DIMMs must be the same type of DIMM architecture (same capacity and same rank classification).

---

**Note** – DIMMs of the same capacity are available with different rank classifications and cannot be mixed in the server module. For example, you cannot install a combination of quad-rank and dual-rank 16-GByte DIMMs. Refer to the label on the DIMM for capacity and rank information.

---

## Related Information

- [“DIMM Locations” on page 77](#)
- [“Memory Faults” on page 75](#)
- [“Locate a Faulty DIMM” on page 80](#)
- [“Remove a DIMM” on page 81](#)
- [“Install a DIMM” on page 82](#)
- [“Clear the Fault and Verify the Functionality of the Replacement DIMM” on page 84](#)

---

# DIMM Handling Precautions



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**Caution** – This procedure involves handling circuit boards that are extremely sensitive to static electricity. Ensure that you follow ESD preventative practices to avoid damaging the circuit boards.

---



---

**Caution** – Components inside the chassis might be hot. Use caution when servicing components inside the chassis.

---

## Related Information

- [“Locate a Faulty DIMM” on page 80](#)
- [“Remove a DIMM” on page 81](#)
- [“Install a DIMM” on page 82](#)
- [“DIMM Configuration Guidelines” on page 79](#)

---

## ▼ Locate a Faulty DIMM

This procedure describes how to use the DIMM LEDs on the motherboard to pinpoint the physical location of a faulty DIMM.

---

**Note** – You can also obtain the location of the faulty DIMM using the Oracle ILOM `show faulty` command. This command displays the FRU name (such as `/SYS/MB/CMP0/BOB0/CH0`). Use the FRU name and information to locate the faulty DIMM. See [“DIMM Locations” on page 77](#).

---

### 1. Check the front panel Fault LED.

See [“Diagnostics LEDs” on page 10](#).

When a faulty DIMM is detected, the front panel Fault LED and the motherboard DIMM Fault LEDs are illuminated. Before opening the server module to check the DIMM Fault LEDs, verify that the Fault LED is lit.

- If the Fault LED is not lit, and you suspect there is a problem, see [“Diagnostics Process” on page 7](#).

- If the Fault LED is lit, go to the next step.
- 2. **(If needed) Prepare for service.**  
See [“Preparing for Service” on page 51.](#)
- 3. **Press the Remind button on the motherboard.**  
While the Remind button is pressed, an LED next to the faulty DIMM illuminates, enabling you to identify the faulty DIMM. See [“DIMM Locations” on page 77.](#)

---

**Tip** – The DIMM Fault LEDs are small and difficult to identify when they are not illuminated. If you do not see any illuminated LEDs in the area of the DIMM LEDs, assume that the DIMMs are not faulty.

---

- 4. **Remove the faulty DIMM.**  
See [“Remove a DIMM” on page 81.](#)

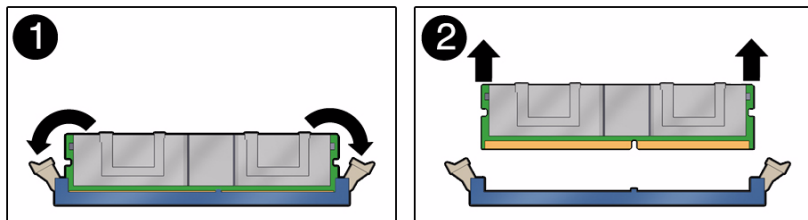
#### Related Information

- [“DIMM Configuration Guidelines” on page 79](#)
- [“DIMM Locations” on page 77](#)
- [“Remove a DIMM” on page 81](#)

---

## ▼ Remove a DIMM

- 1. **(If needed) Prepare for service.**  
See [“Preparing for Service” on page 51.](#)
- 2. **(If needed) Locate the faulty DIMM.**  
See [“Locate a Faulty DIMM” on page 80.](#)
- 3. **Remove the DIMM from the motherboard.**



- a. Push down on the ejector tabs on each side of the DIMM until the DIMM is released (panel 1).
  - b. Grasp the top corners of the DIMM, and lift and remove it from the server module (panel 2).
  - c. Place the DIMM on an antistatic mat.
4. Install a replacement DIMM.  
See [“Install a DIMM” on page 82](#).

---

**Note** – DIMMs of the same capacity are available with different rank classifications and cannot be mixed in the server module. For example, you cannot install a combination of quad-rank and dual-rank 16-GByte DIMMs. Refer to the label on the DIMM for capacity and rank information. See [“DIMM Configuration Guidelines” on page 79](#).

---

#### **Related Information**

- [“Install a DIMM” on page 82](#)
- [“DIMM Locations” on page 77](#)
- [“DIMM Configuration Guidelines” on page 79](#)

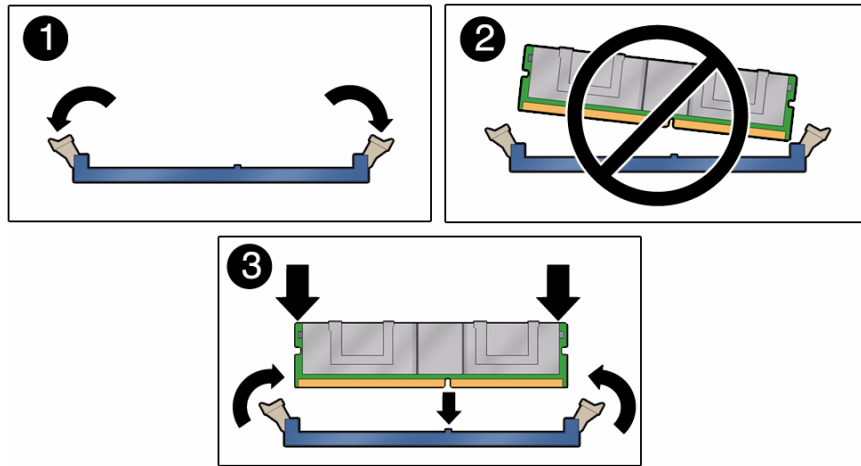
---

## ▼ Install a DIMM

DIMMs of the same capacity are available with different rank classifications and cannot be mixed in the server module. For example, you cannot install a combination of quad-rank and dual-rank 16-GByte DIMMs. Refer to the label on the DIMM for capacity and rank information. See [“DIMM Configuration Guidelines” on page 79](#).

1. **(If needed) Prepare the server module for service and remove the faulty DIMM.**  
See [“Preparing for Service” on page 51](#) and [“Remove a DIMM” on page 81](#).
2. **Unpack the replacement DIMM and set it on an antistatic mat.**  
See [“DIMM Handling Precautions” on page 80](#).
3. **Ensure that the DIMM ejector tabs are in the open position (panel 1).**





**4. Line up the replacement DIMM with the connector.**

Align the DIMM notch with the key in the connector, as in panel 3. This action ensures that the DIMM is oriented correctly. Panel 2 shows an incorrect alignment.

**5. Push the DIMM into the connector until the ejector tabs lock the DIMM in place.**

If the DIMM does not easily seat into the connector, verify that the orientation of the DIMM is correct. Never apply excessive force.

**6. Return the server module to operation.**

See [“Returning the Server Module to Operation” on page 119](#)

**7. Perform one of the following tasks to verify the DIMM:**

- Verify a replacement DIMM. See [“Clear the Fault and Verify the Functionality of the Replacement DIMM” on page 84](#).
- Verify additional memory. See [“Verify DIMM Functionality” on page 87](#).

**Related Information**

- [“Remove a DIMM” on page 81](#)
- [“DIMM Configuration Guidelines” on page 79](#)
- [“DIMM Locations” on page 77](#)

## ▼ Clear the Fault and Verify the Functionality of the Replacement DIMM

### 1. Ensure that the following conditions are met:

- The server module is in Standby mode (installed in a powered modular system, but the server module's host is not started).  
See [“Set the Server Module to a Ready-to-Remove State” on page 60.](#)
- You have connectivity to the SP.  
See [“Access the SP \(Oracle ILOM\)” on page 15](#)

### 2. Access the Oracle ILOM prompt.

See [“Access the SP \(Oracle ILOM\)” on page 15.](#)

### 3. Determine how to clear the fault.

The method you use to clear a fault depends on how the fault is identified by the `show faulty` command.

Examples:

- If the fault is a *host-detected fault* (displays a UUID), continue to [Step 4](#). For example:

-> show faulty		
Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/MB/CMP0/BOB0/CH0/D0
/SP/faultmgmt/0	timestamp	Dec 14 22:43:59
/SP/faultmgmt/0/ faults/0	sunw-msg-id	SUN4V-8000-DX
/SP/faultmgmt/0/ faults/0	uuid	3aa7c854-9667-e176-efe5-e487e520 7a8a
/SP/faultmgmt/0/ faults/0	timestamp	Apr 24 22:43:59

- If the fault was detected by POST and resulted in the DIMM being disabled, you will see something similar to the following output:

-> <b>show faulty</b>		
Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/MB/CMP0/BOB1/CH0/D0
/SP/faultmgmt/0	timestamp	Apr 24 16:40:56
/SP/faultmgmt/0/	timestamp	Apr 24 16:40:56 faults/0
/SP/faultmgmt/0/	sp_detected_fault	/SYS/MB/CMP0/BOB1/CH0/D0
faults/0		Forced fail (POST)

In most cases, the replacement of the faulty DIMM is detected when the SP is power cycled. In this case, the fault is automatically cleared. If the fault is still displayed by the `show faulty` command, then use the `set` command to enable the DIMM and clear the fault.

Example:

```
-> set /SYS/MB/CMP0/BOB0/CH0/D0 component_state=Enabled
```

#### 4. Verify the repair.

- Set the virtual keyswitch to `diag` so that POST will run in Service mode.

```
-> set /SYS/keyswitch_state=Diag
Set 'keyswitch_state' to 'Diag'
```

- Power cycle the server module.

```
-> stop /SYS
Are you sure you want to stop /SYS (y/n)? y
Stopping /SYS
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
Starting /SYS
```

---

**Note** – The server module takes about one minute to power off. Use the `show /HOST` command to determine when the host has been powered off. The console will display `status=Powered Off`.

---

c. Switch to the host console to view POST output.

```
-> start /HOST/console
```

Watch the POST output for possible fault messages. The following output is a sign that POST did not detect any faults:

```
.
.
.
0:0:0>INFO:
0:0:0>      POST Passed all devices.
0:0:0>POST:      Return to VBSC.
0:0:0>Master set ACK for vbsc runpost command and spin...
```

---

**Note** – Depending on the configuration of Oracle ILOM variables that affect POST and whether POST detected faults or not, the server module might boot, or the server module might remain at the ok prompt. If the server module is at the ok prompt, type **boot**.

---

d. Return the virtual keyswitch to Normal mode.

```
-> set /SYS keyswitch_state=Normal
Set 'keyswitch_state' to 'Normal'
```

e. Switch to the host console and type the Oracle Solaris OS `fmadm faulty` command.

```
# fmadm faulty
```

No memory faults should be displayed.

If faults are reported, refer to the [“Diagnostics Process” on page 7](#) for an approach to diagnose the fault.

5. Switch to the Oracle ILOM prompt.

6. Type the `show faulty` command.

- If the fault was detected by the host and the fault information persists, the output will be similar to the following example:

```
-> show faulty
Target                | Property                | Value
-----+-----+-----
```

/SP/faultmgmt/0	fru	/SYS/MB/CMP0/BOB0/CH0/D0
/SP/faultmgmt/0	timestamp	Dec 14 22:43:59
/SP/faultmgmt/0/ faults/0	sunw-msg-id	SUN4V-8000-DX
/SP/faultmgmt/0/ faults/0	uuid	3aa7c854-9667-e176-efe5-e487e520 7a8a
/SP/faultmgmt/0/ faults/0	timestamp	Dec 14 22:43:59

- If the `show faulty` command does not report a fault with a UUID, the fault is cleared. You do not need to proceed with the following steps.

7. (Only if previous steps did not clear the fault) Type the `set` command.

```
-> set /SYS/MB/CMP0/BOB0/CH0/D0 clear_fault_action=true
Are you sure you want to clear /SYS/MB/CMP0/BOB0/CH0/D0 (y/n)? y
Set 'clear_fault_action' to 'true'
```

8. (Only if previous steps did not clear the fault) Switch to the host console and type the `fmadm repair` command with the UUID.

Use the same UUID that was displayed from the output of the Oracle ILOM `show faulty` command.

```
# fmdm repair 3aa7c854-9667-e176-efe5-e487e5207a8a
```

Related Information

- “Install a DIMM” on page 82
- “Verify DIMM Functionality” on page 87



## ▼ Verify DIMM Functionality

1. Access the Oracle ILOM prompt.

Refer to the *SPARC T4 Series Servers Administration Guide* for instructions.

2. Use the `show faulty` command to determine how to clear the fault.

- If `show faulty` indicates a POST-detected fault, go to [Step 3](#).
- If `show faulty` output displays a UUID, which indicates a host-detected fault, go to [Step 4](#).

**3. Use the `set` command to enable the DIMM that was disabled by POST.**

In most cases, replacement of a faulty DIMM is detected when the SP is power cycled. In those cases, the fault is automatically cleared from the server module. If `show faulty` still displays the fault, the `set` command will clear it.

```
-> set /SYS/MB/CMP0/BOB0/CH0/D0 component_state=Enabled
```

**4. For a host-detected fault, verify the new DIMM.**

**a. Set the virtual keyswitch to `diag` so that POST will run in Service mode.**

```
-> set /SYS/keyswitch_state=Diag
Set 'keyswitch_state' to 'Diag'
```

**b. Power cycle the server module host.**

```
-> stop /SYS
Are you sure you want to stop /SYS (y/n)? y
Stopping /SYS
-> start /SYS
Are you sure you want to start /SYS (y/n)? y
Starting /SYS
```

---

**Note** – Use the `show /HOST` command to determine when the host has been powered off. The console will display `status=Powered Off`. Allow approximately one minute before typing this command.

---

**c. Switch to the host console to view POST output.**

Watch the POST output for possible fault messages. The following output indicates that POST did not detect any faults:

```
-> start /HOST/console
.
.
.
0:7:2>INFO:
0:7:2>    POST Passed all devices.
0:7:2>POST:    Return to VBSC.
0:7:2>Master set ACK for vbsc runpost command and spin...
```

---

**Note** – The server module might boot automatically at this point. If so, go directly to [Step e](#). If it remains at the `ok` prompt go to [Step d](#).

---

d. If the server module remains at the `ok` prompt, type `boot`.

e. Return the virtual keyswitch to Normal mode.

```
-> set /SYS keyswitch_state=Normal
Set 'keyswitch_state' to 'Normal'
```

f. Switch to the host console and type the Oracle Solaris OS `fmadm faulty` command.

```
# fmadm faulty
```

If any faults are reported, see the diagnostics instructions in “[Oracle ILOM Troubleshooting Overview](#)” on [page 12](#).

5. Switch to the Oracle ILOM command shell.

6. Type the `show faulty` command.

```
-> show faulty
```

Target	Property	Value
/SP/faultmgmt/0	fru	/SYS/MB/CMP0/BOB0/CH1/D0
/SP/faultmgmt/0	timestamp	Dec 14 22:43:59
/SP/faultmgmt/0/ faults/0	sunw-msg-id	SUN4V-8000-DX
/SP/faultmgmt/0/ faults/0	uuid	3aa7c854-9667-e176-efe5-e487e520 7a8a
/SP/faultmgmt/0/ faults/0	timestamp	Dec 14 22:43:59

If the `show faulty` command reports a fault with a UUID go to [Step 7](#). If `show faulty` does *not* report a fault with a UUID, you have completed the verification process.

7. Switch to the host console and type the `fmadm repair` command with the UUID.

Use the same UUID that was displayed from the output of the Oracle ILOM `show faulty` command.

```
# fmadm repair 3aa7c854-9667-e176-efe5-e487e520
```

**Related Information**

- [“Remove a DIMM” on page 81](#)
- [“Install a DIMM” on page 82](#)
- [“DIMM Configuration Guidelines” on page 79](#)
- [“DIMM Locations” on page 77](#)



# Servicing the REM

The server module supports the installation of one REM. For a list of supported REMs, refer to the *SPARC T4-1B Server Module Product Notes*.

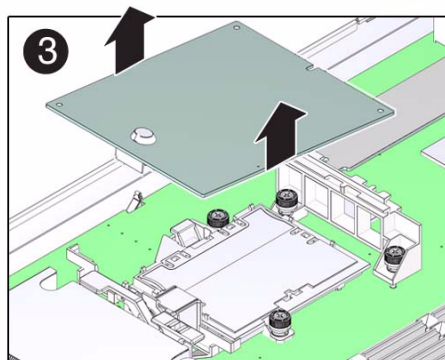
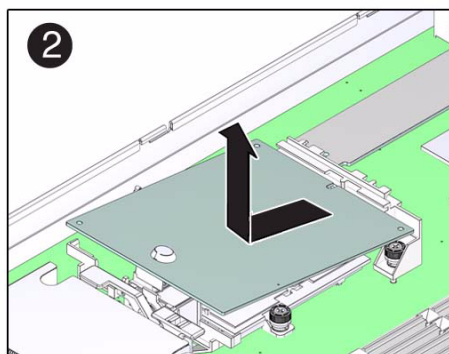
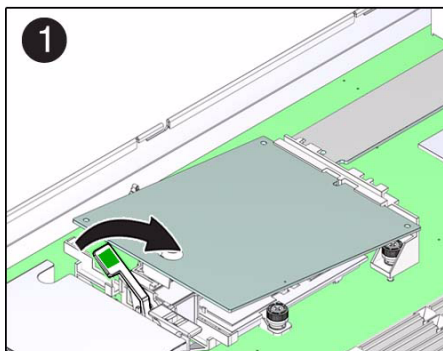
Description	Links
Troubleshoot a REM problem.	Refer to the documentation for the REM.
Replace a REM.	<a href="#">“Remove a REM” on page 91</a> <a href="#">“Install a REM” on page 92</a>
Install a REM.	<a href="#">“Install a REM” on page 92</a>

## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

## ▼ Remove a REM

1. **Prepare for service.**  
See [“Preparing for Service” on page 51](#).
2. **Lift the REM ejector arm (panel 1).**



3. Rotate the card up and off the retainer (panels 2 and 3).

4. Set the card on an antistatic surface.

5. Install a REM.

See [“Install a REM” on page 92](#).

#### Related Information

- [“Install a REM” on page 92](#)

## ▼ Install a REM

For information about specific configuration tasks for your REM, refer to the REM documentation.

1. (If needed) Prepare for service.

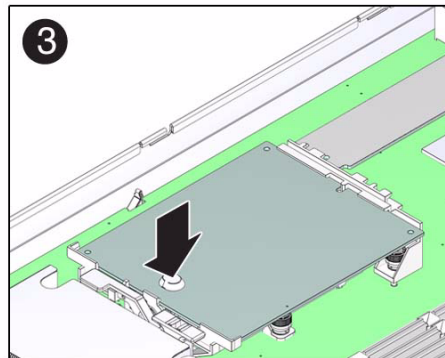
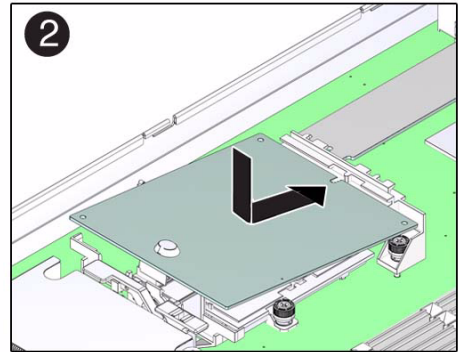
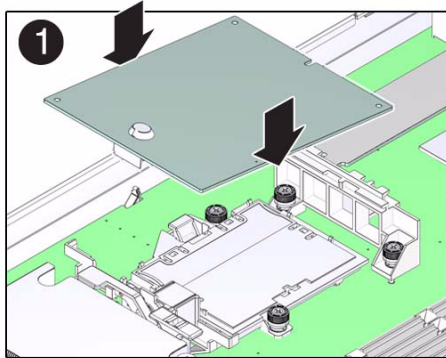
See [“Preparing for Service” on page 51](#).

**2. (If needed) Remove a REM.**

See [“Remove a REM” on page 91.](#)

**3. Align the REM for installation (panel 1).**

**4. Slide the end of the REM that is opposite the connector under the tabs of the plastic standoff (panel 2).**



**5. Press the REM until the connector is fully seated on the motherboard (panel 3).**

If there is a rubber bumper on the REM, you can press down on it directly to seat the connector.

**6. Return the server module to operation.**

See [“Returning the Server Module to Operation” on page 119.](#)

**7. Configure or verify the RAID after installing the REM.**

Refer to the *Server Module Administration Guide* for information about RAID configuration on this server module.

**Related Information**

- [“Remove a REM” on page 91](#)



# Servicing the FEM

The server module supports the installation of one FEM. To see a list of supported FEMs for this server module, refer to the *SPARC T4-1B Server Module Product Notes*.

Description	Links
Replace a FEM.	<a href="#">“Remove a FEM” on page 95</a> <a href="#">“Install a FEM” on page 96</a>
Install a FEM.	<a href="#">“Install a FEM” on page 96</a>

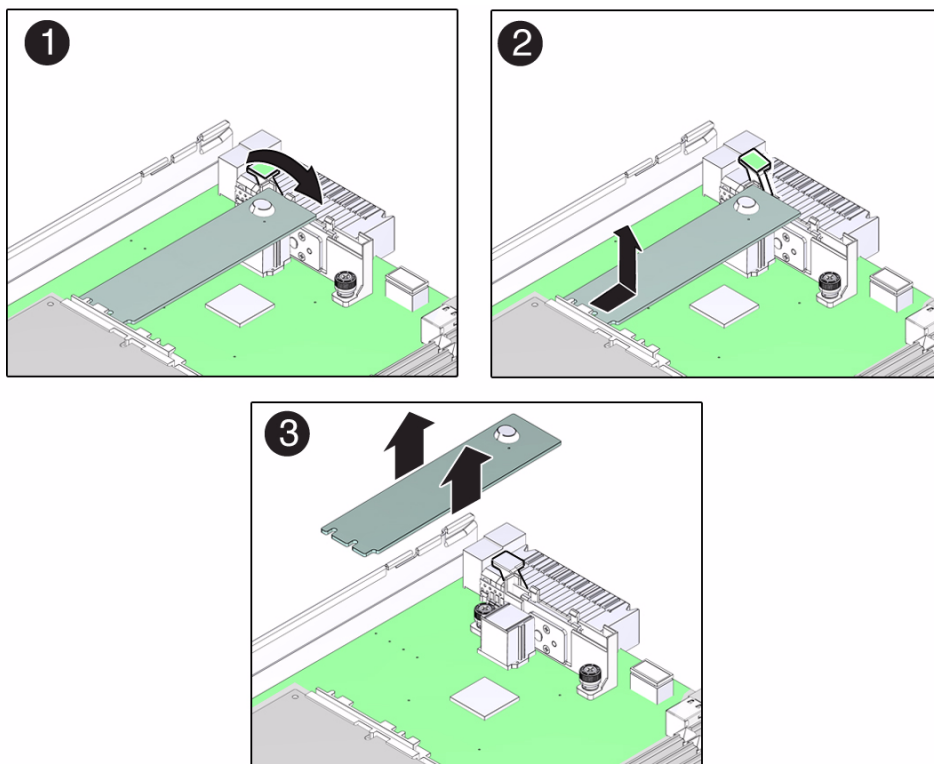
## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

## ▼ Remove a FEM

FEMs are available in single and double widths. Figures in this procedure depict a single-width FEM, but the procedure applies to both types of FEMs.

1. **Prepare for service.**  
See [“Preparing for Service” on page 51](#).
2. **Lift the lever to eject the FEM (panel 1).**



3. Tilt the FEM up (panel 2).
4. Remove the FEM (panel 3) and place the FEM on an antistatic mat.
5. (If needed) Install a FEM.  
See [“Install a FEM” on page 96](#).

#### Related Information

- [“Install a FEM” on page 96](#)

---

## ▼ Install a FEM

This procedure applies to any of the form factors of FEM cards that are supported by this server module.

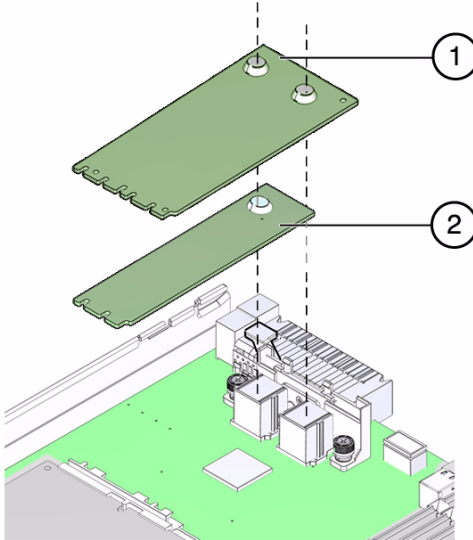
**1. Prepare for service.**

See [“Preparing for Service”](#) on page 51.

**2. (If needed) Remove a FEM.**

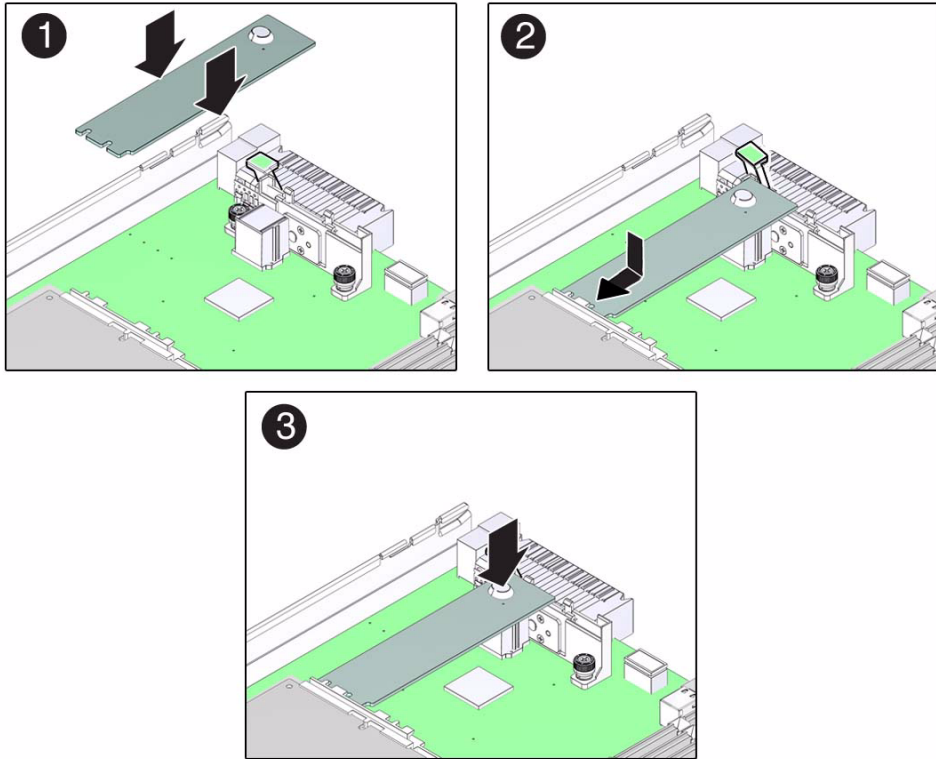
See [“Remove a FEM”](#) on page 95.

**3. Determine the correct set of motherboard FEM connectors for your FEM.**



- A double-width FEM (card 1) uses connectors FEM-0 and FEM-1.
- A single-width FEM (card 2) uses connector FEM-0.

**4. Insert the FEM edge into the bracket and carefully align the FEM so that the card connects with the correct motherboard connectors (panels 1 and 2).**



**5. Lower the card and press the card into place (Panel 3).**

If the card has rubber bumpers you can press directly on them to seat the card into the connectors.

**6. Return the server module to operation.**

See [“Returning the Server Module to Operation”](#) on page 119.

**Related Information**

- [“Remove a FEM”](#) on page 95



# Servicing the SP Card

---

The server module has an SP card with firmware that provides Oracle ILOM.

- [“Remove the SP Card” on page 99](#)
- [“Install the SP Card” on page 100](#)

## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

---

## ▼ Remove the SP Card

The SP contains firmware. The motherboard also contains firmware. The firmware on the SP and motherboard must be compatible.

When you replace the SP, the firmware on the new SP might be incompatible with the existing motherboard firmware. In this case, you must update the system firmware which updates the SP and motherboard firmware to compatible versions. See [“Install the SP Card” on page 100](#).

### 1. If possible, save the configuration information for the SP.

Refer to the related procedures using Oracle ILOM in the *Server Module Administration Guide*.

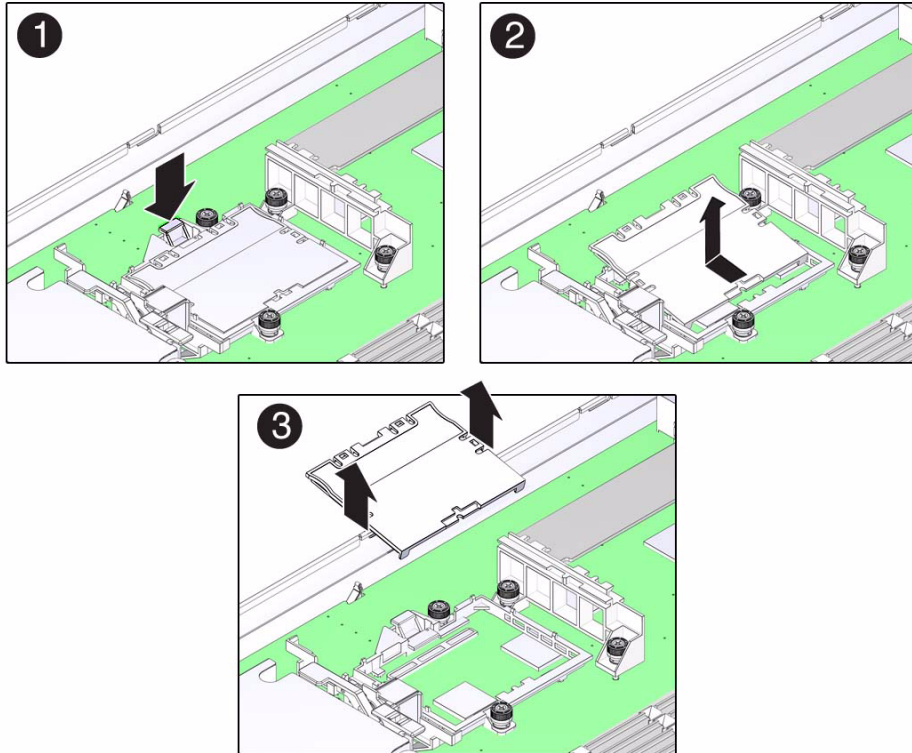
### 2. Prepare for service.

See [“Preparing for Service” on page 51](#).

### 3. If a REM is installed in the server module, remove the REM.

See [“Remove a REM” on page 91](#).

### 4. Push down on the tab to eject the SP card (panel 1).



**5. Rotate the card up and off the retainer (panels 2 and 3).**

Set the card on an antistatic mat.

**6. Install the new card.**

See [“Install the SP Card” on page 100](#).

#### **Related Information**

- [“Install the SP Card” on page 100](#)

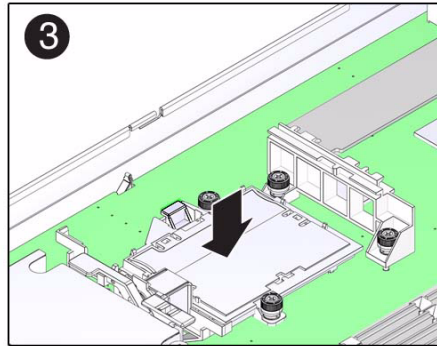
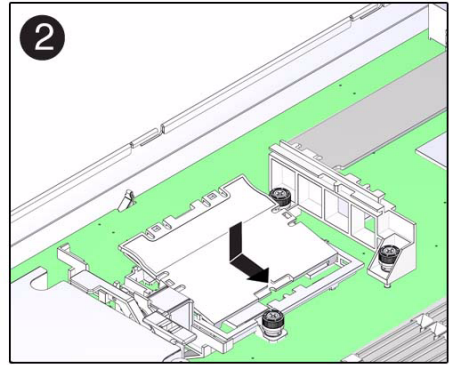
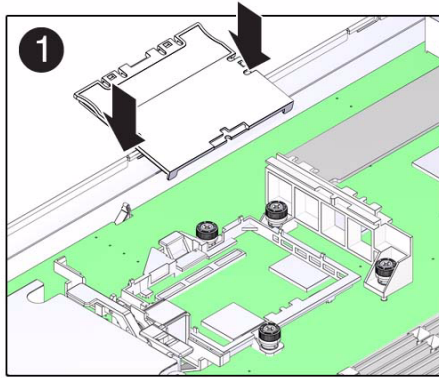
---

## ▼ Install the SP Card

**1. (If needed) Remove the SP card.**

See [“Remove the SP Card” on page 99](#).

2. Insert the replacement SP card into the retainer (panel 1).  
Ensure that the tab is aligned with the key (panel 2).



3. Seat the SP card into the connector by pressing the card toward the tabs while pressing down (panel 3).  
When the SP card is in place, the lever will close.
4. Return the server module to the chassis.  
See [“Returning the Server Module to Operation”](#) on page 119

**5. Access Oracle ILOM on the SP.**

See [“Access the SP \(Oracle ILOM\)” on page 15.](#)

If the replacement service processor detects that the service processor firmware is not compatible with the existing host firmware, further action is suspended and the following message is displayed:

Unrecognized Chassis: This module is installed in an unknown or unsupported chassis. You must upgrade the firmware to a newer version that supports this chassis.
---

If you see this message, go to [Step 6](#). Otherwise, go to [Step 7](#).

**6. Download the system firmware.**

Refer to the Oracle ILOM documentation for instructions.

**7. If you created a backup of the SP configuration, use the Oracle ILOM restore utility to restore the configuration.**

**8. Return the server module to operation.**

**Related Information**

- [“Remove the SP Card” on page 99](#)

# Servicing the ID PROM

---

The ID PROM, sometimes referred to as the SCC, provides the server module with the host ID, MAC addresses, and some Oracle ILOM configuration information.

The ID PROM does not typically require replacement. However, if you replace the ID PROM, be aware that the host ID and MAC address will change.

When you replace the enclosure assembly, swap the ID PROM from the original enclosure assembly to the replacement enclosure assembly. This action ensures that your server module will maintain the same host ID and MAC address.

- [“Remove the ID PROM” on page 103](#)
- [“Install the ID PROM” on page 104](#)
- [“Verify the ID PROM” on page 105](#)

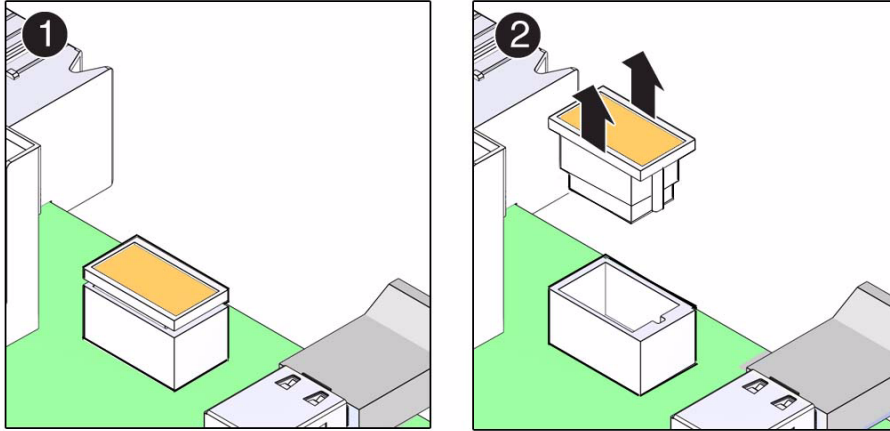
## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

---

## ▼ Remove the ID PROM

1. **Prepare for service.**  
See [“Preparing for Service” on page 51](#).
2. **Locate the ID PROM on the motherboard (panel 1).**



3. Lift the ID PROM (panel 1) straight up from its socket (panel 2).

Place the ID PROM on an antistatic mat.

4. Install the ID PROM.

See [“Install the ID PROM” on page 104](#).

#### **Related Information**

- [“Install the ID PROM” on page 104](#)
- [“Verify the ID PROM” on page 105](#)

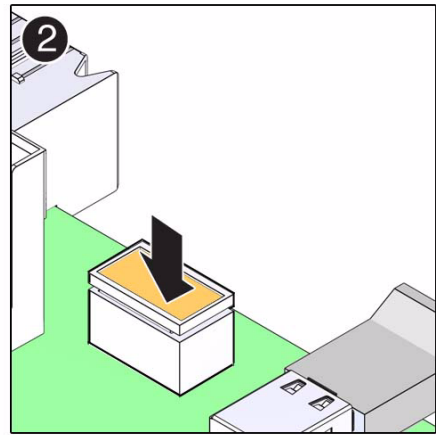
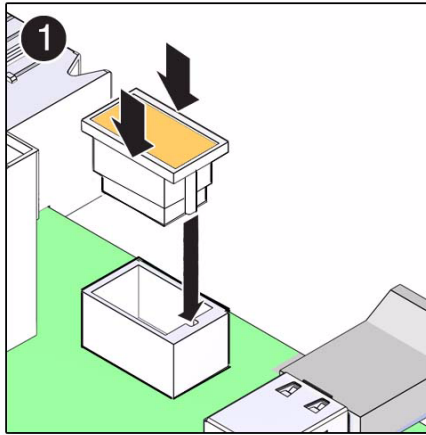
---

## ▼ Install the ID PROM

1. (If needed) Remove the ID PROM.

See [“Remove the ID PROM” on page 103](#).

2. Locate the ID PROM socket on the motherboard (panel 1).



3. Align the ID PROM notched end with the notched end on the motherboard socket and press in place (panel 2).
4. Return the server module to operation.  
See [“Returning the Server Module to Operation”](#) on page 119.
5. Verify the ID PROM.  
See [“Verify the ID PROM”](#) on page 105.

#### Related Information

- [“Remove the ID PROM”](#) on page 103
- [“Verify the ID PROM”](#) on page 105

## ▼ Verify the ID PROM

The host MAC address and the host ID values are stored in the ID PROM. This task describes ways to display these values.

1. Display the MAC address that is stored in the ID PROM.

Example using the Oracle ILOM `show` command:

```
-> show /HOST macaddress
/HOST
Properties:
macaddress = 00:21:28:34:29:9c
```

## 2. Display the host ID.

Example using the Oracle Solaris `hostid` command:

```
# hostid
85c1bd7c
```

## 3. Display the Ethernet address.

Example using the Oracle Solaris `ifconfig` command:

```
# ifconfig -a
lo0: flags=2001000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv4,VIRTUAL> mtu 8232
index 1
    inet 127.0.0.1 netmask ff000000
igb0: flags=1004843<UP,BROADCAST,RUNNING,MULTICAST,DHCP,IPv4> mtu 1500 index
    inet 10.6.91.117 netmask fffffffe0 broadcast 10.6.91.255
    ether 0:21:28:7f:68:44
#
```

## Related Information

- [“Remove the ID PROM” on page 103](#)
- [“Install the ID PROM” on page 104](#)



# Servicing a USB Flash Drive

---

You can install one USB flash drive in the server module.

Description	Links
Replace a USB flash drive.	<a href="#">“Remove a USB Flash Drive” on page 107</a> <a href="#">“Install a USB Flash Drive” on page 108</a>
Add a USB flash drive.	<a href="#">“Install a USB Flash Drive” on page 108</a>

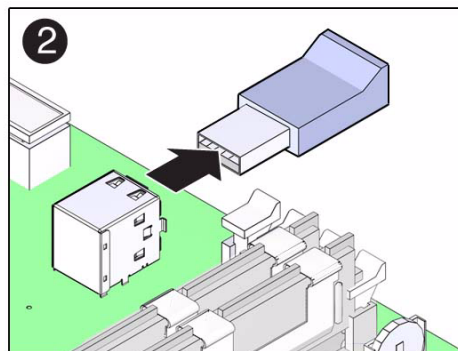
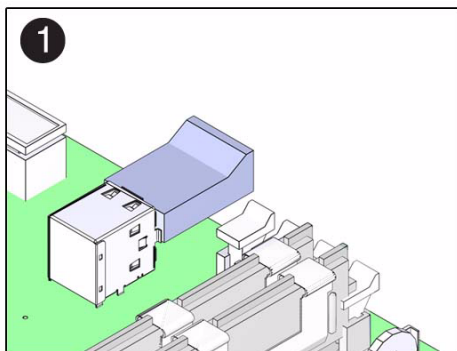
## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

---

## ▼ Remove a USB Flash Drive

1. **Prepare for service.**  
See [“Preparing for Service” on page 51](#).
2. **Locate the USB flash drive at the rear of the server module (panel 1).**



3. Pull the drive out (panel 2).
4. (If needed) Install a USB flash drive.  
See [“Install a USB Flash Drive” on page 108](#).

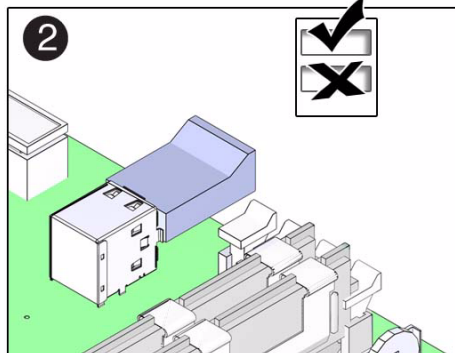
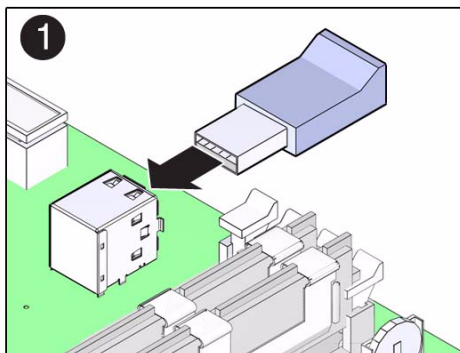
#### Related Information

- [“Install a USB Flash Drive” on page 108](#)

## ▼ Install a USB Flash Drive

The server module has a USB port on the motherboard. The USB port accepts USB flash drives that do not exceed a length of 39 mm.

1. Prepare for service.  
See [“Preparing for Service” on page 51](#).
2. (If needed) Remove a USB flash drive.  
See [“Remove a USB Flash Drive” on page 107](#).
3. Locate the USB connector on the motherboard.



4. Plug your USB flash drive into the upper port of the USB connector (panels 1 and 2).

Do not use the lower port of this connector.

5. Return the server module to operation.

See [“Returning the Server Module to Operation”](#) on page 119.

### Related Information

- [“Remove a USB Flash Drive”](#) on page 107



# Servicing the Battery

---

The battery operates the clock for the server module.

- [“Replace the Battery” on page 111](#)

## Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

---

## ▼ Replace the Battery

The battery maintains server module time when the server module is powered off. If the server module fails to maintain the proper time when it is powered off, replace the battery.

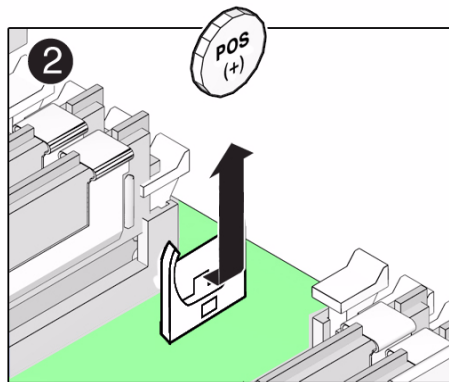
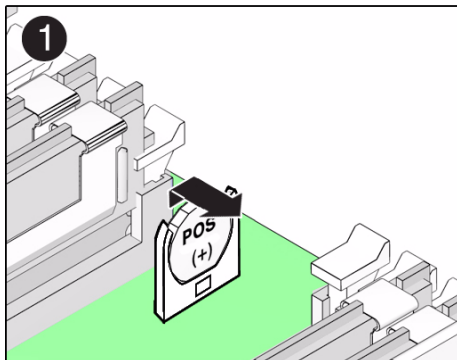
Use a CR2032 replacement battery.

**1. Prepare for service.**

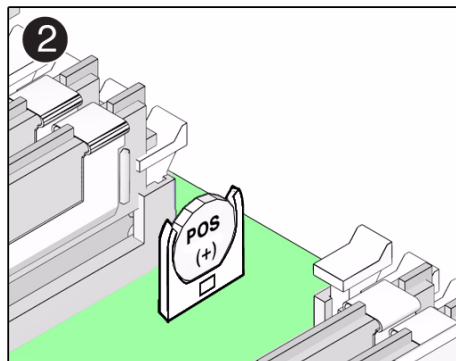
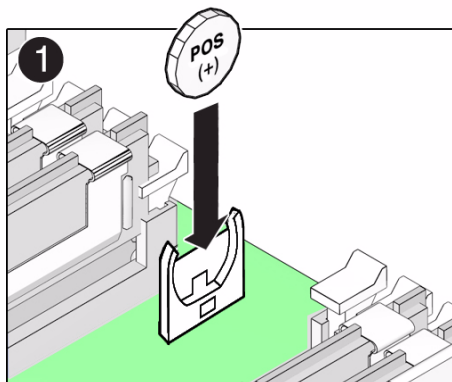
See [“Preparing for Service” on page 51](#).

**2. Push the top of the battery forward, then lift the battery from the holder (panel 1 and 2).**

If you need more clearance, remove the DIMM in slot CMP0/BOB3/CH1/D0 (nearest the battery). See [“DIMM Locations” on page 77](#) and [“Remove a DIMM” on page 81](#).



3. Install the replacement battery with the negative (-) side facing the nearby DIMM slot CMP0 / BOB3 / CH1 / D0.



4. (If removed) Replace the DIMM in CMP0 / BOB3 / CH1 / D0.  
See [“Install a DIMM”](#) on page 82.
5. Return the server module to operation.  
See [“Returning the Server Module to Operation”](#) on page 119
6. Access the Oracle ILOM prompt.  
See [“Access the SP \(Oracle ILOM\)”](#) on page 15.
7. Set the clock's day and time.  
For example:

```
-> set /SP/clock datetime=061716192011
-> show /SP/clock
```

```
/SP/clock
Targets:
Properties:
  datetime = Fri JUN 17 16:19:56 2011
  timezone = GMT (GMT)
  usentpserver = disabled
```

### **Related Information**

- [“Servicing the FEM” on page 95](#)
- [“Returning the Server Module to Operation” on page 119](#)





# Replacing the Server Module Enclosure Assembly (Motherboard)

---

When certain parts and components in the server module, such as the motherboard, require replacing, you must replace a high-level assembly called the *enclosure assembly*. This includes a new server module chassis with the motherboard and many other components already installed.

If you determine that a faulty component is not one of the replaceable FRUs described in this document, the enclosure assembly must be replaced.

---

**Note** – This procedure must be performed by an Oracle field service representative.

---

- [“Transfer Components to Another Enclosure Assembly” on page 115](#)

## Related Information

- [“Identifying Components” on page 1](#)
- [“Detecting and Managing Faults” on page 5](#)
- [“Preparing for Service” on page 51](#)

---

## ▼ Transfer Components to Another Enclosure Assembly

When you replace an enclosure assembly, you must move a number of FRUs from the original server module to the same locations in the replacement assembly.

When you transfer the SP and ID PROM from the old board to the new you preserve system-specific information that is stored on these modules.

When you replace the motherboard, the firmware on the new motherboard might be incompatible with the firmware on the SP. In this case, you must update the system firmware which updates the SP and motherboard firmware to compatible versions.

**1. Prepare to take all ESD precautions when working with both the original server module and the new enclosure assembly.**

Prepare to place all components on an antistatic mat unless you install each component immediately in the new enclosure assembly.

Follow the precautions explained in [“Preparing for Service” on page 51](#).

**2. Remove the top cover from the original server module and the new enclosure assembly.**

See [“Remove the Cover” on page 63](#).

**3. Transfer the drives from the original server module to the enclosure assembly.**

See [“Servicing Drives” on page 65](#).

**4. Transfer the drive fillers from the original server module to the enclosure assembly.**

See [“Remove a Drive Filler” on page 70](#) and [“Install a Drive Filler” on page 73](#).

**5. Transfer the FEM (if present) from the original server module to the enclosure assembly.**

Install the FEM in the same connectors in the enclosure assembly. See [“Servicing the FEM” on page 95](#).

**6. Remove the REM (if present) from the original server module.**

See [“Servicing the REM” on page 91](#).

Before installing the REM in the enclosure assembly, move the SP card to the enclosure assembly. See [Step 7](#).

**7. Transfer the SP card from the original server module to the enclosure assembly.**

See [“Servicing the SP Card” on page 99](#).

**8. Install the REM (if present) into the enclosure assembly.**

See [“Servicing the REM” on page 91](#).

**9. Transfer the ID PROM from the original server module to the enclosure assembly.**

See [“Servicing the ID PROM” on page 103](#).

**10. Transfer the USB flash drive (if present) from the original server module to the enclosure assembly.**

Ensure that you install a USB flash drive only in the top slot of the connector. See [“Servicing a USB Flash Drive” on page 107](#).

**11. (If needed) Transfer the battery to the enclosure assembly.**

If a battery is present in the new enclosure assembly, do not transfer the original battery.

See [“Servicing the Battery” on page 111.](#)

**12. Transfer the DIMMs from the original server module to the enclosure assembly.**

Move each DIMM to the same slot in the enclosure assembly. See [“Servicing Memory” on page 75.](#)

**13. Attach the original cover to the enclosure assembly.**

See [“Replace the Cover” on page 119.](#)

**14. Insert the completed enclosure assembly in the same slot as the original server module.**

See [“Install the Server Module Into the Modular System” on page 120.](#)

**15. Start the server module host.**

See [“Power On the Host \(Oracle ILOM\)” on page 122.](#)

**16. Access Oracle ILOM on the SP.**

See [“Access the SP \(Oracle ILOM\)” on page 15.](#)

If the replacement service processor detects that the service processor firmware is not compatible with the existing host firmware, further action is suspended and the following message is displayed:

Unrecognized Chassis: This module is installed in an unknown or unsupported chassis. You must upgrade the firmware to a newer version that supports this chassis.

If you see this message, go to [Step 17](#). Otherwise, go to [Step 18](#).

**17. Download the system firmware.**

Refer to the Oracle ILOM documentation for instructions.

**18. Perform diagnostics to verify the proper operation of the server module.**

See [“Detecting and Managing Faults” on page 5.](#)

**19. Transfer the serial number and product number to the FRUID of the new enclosure assembly.**

This must be done in a special service mode by trained service personnel.

---

**Note** – The replacement enclosure assembly does not have a label with the serial number on the front of the server module, as was present on the original server module.

---

**20. Update any customer database that contains RFID data.**

Use the values from the RFID on the new enclosure assembly.

The RFID on the original server module contained different values.

**Related Information**

- [“Detecting and Managing Faults” on page 5](#)
- [“Identifying Components” on page 1](#)

# Returning the Server Module to Operation

These topics describe how to return Oracle's SPARC T4-1B server module to operation after removing it from the modular system for service.

Step	Description	Links
1.	Replace the server module cover.	<a href="#">"Replace the Cover" on page 119</a>
2.	Install the server module into the modular system.	<a href="#">"Install the Server Module Into the Modular System" on page 120</a>
3.	Power on the server module host using Oracle ILOM or the power button.	<a href="#">"Power On the Host (Oracle ILOM)" on page 122</a> <a href="#">"Power On the Host (Power Button)" on page 122</a>

## Related Information

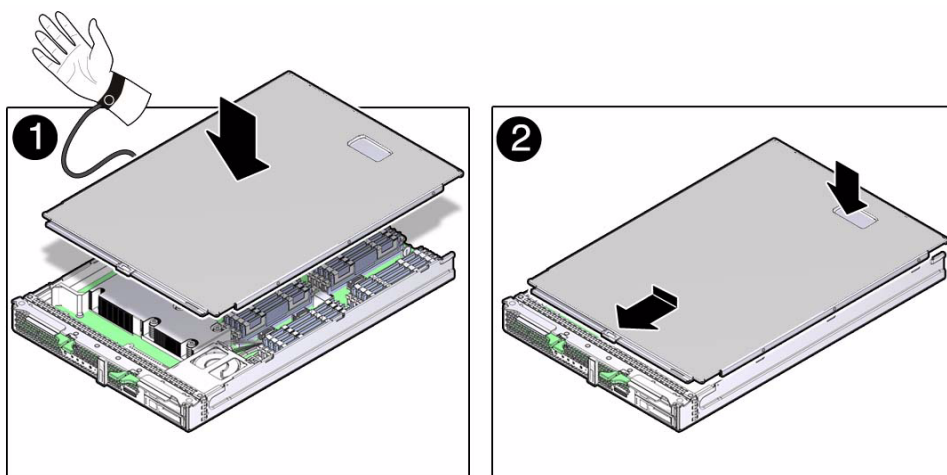
- ["Preparing for Service" on page 51](#)

## ▼ Replace the Cover

Perform this task after completing installation or servicing of components inside the server module.

### 1. Set the cover on the server module (panel 1).

The cover edge hangs over the rear of the server module by about half an inch (1 cm).



2. Slide the cover forward until it latches into place (panel 2).

3. Install the server module into the modular system chassis.

See [“Install the Server Module Into the Modular System”](#) on page 120.

#### Related Information

- [“Install the Server Module Into the Modular System”](#) on page 120
- [“Remove the Cover”](#) on page 63

---

## ▼ Install the Server Module Into the Modular System



---

**Caution** – Insert a filler panel into an empty modular system slot within 60 seconds of server module removal to ensure proper chassis cooling.

---



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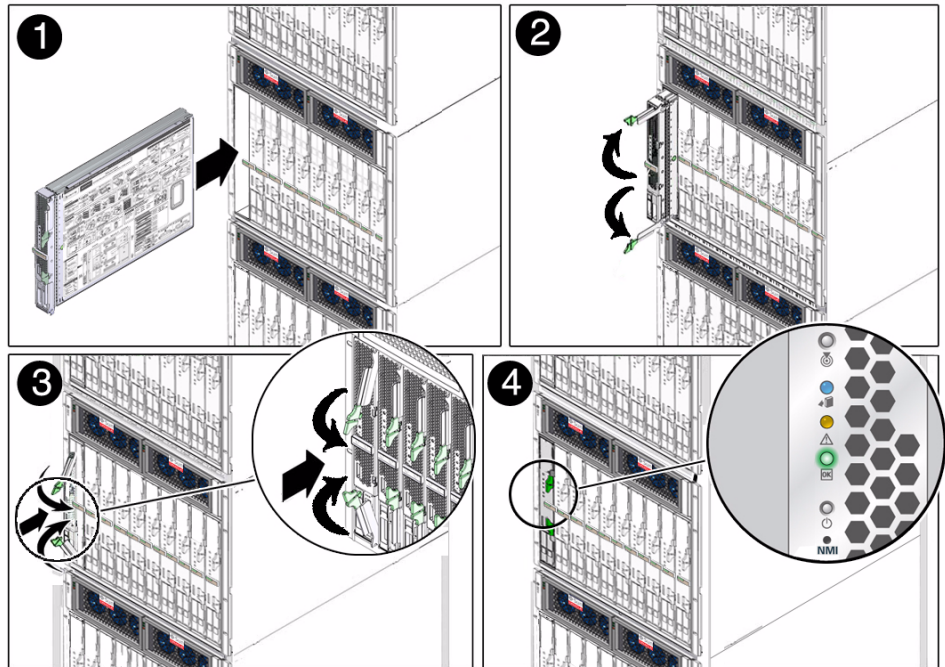
**Caution** – Hold the server module firmly with both hands so that you do not drop it. The server module can weigh as much as 20 pounds (9.0 kg).

---

1. (If needed) Replace the cover.

See [“Replace the Cover”](#) on page 119.

2. (If needed) Remove the rear connector cover from the server module before inserting it in the modular system.
3. Remove a filler panel from the modular system chassis slot you intend to use.  
When the modular system is operating, you must fill every slot with a filler panel or a server module within 60 seconds.
4. Hold the server module in a vertical position so that both ejector levers are on the right (panel 1).



5. Slide the server module into the chassis (panel 2).
6. Close both latches simultaneously, locking the server module in the modular system chassis (panel 3).

Once installed, the following server module activities take place:

- Standby power is applied.
- The front panel LEDs blink three times, then the green OK LED on the front panel blinks for a few minutes.
- Oracle ILOM is initialized on the server module SP and ready to use, but the server module host is not started.

7. Start the server module host.

See [“Power On the Host \(Oracle ILOM\)”](#) on page 122.

### Related Information

- [“Power On the Host \(Oracle ILOM\)” on page 122](#)
- [“Remove the Server Module From the Modular System” on page 61](#)

---

## ▼ Power On the Host (Oracle ILOM)

Perform this step after the server module is installed in a powered modular system.

**1. Install the server module into the modular system.**

See [“Install the Server Module Into the Modular System” on page 120](#).

**2. Access Oracle ILOM on the SP and run the `start /SYS` command.**

See [“Access the SP \(Oracle ILOM\)” on page 15](#).

---

**Note** – The server module power-on process can take several minutes to complete, depending on the amount of installed memory and the configured diagnostic level.

---

By default, the server module boots the Oracle Solaris OS.

**3. Perform any diagnostics that verify the results of servicing the server module.**

### Related Information

- [“Detecting and Managing Faults” on page 5](#)
- [“Power On the Host \(Power Button\)” on page 122](#)

---

## ▼ Power On the Host (Power Button)

Perform this step after Oracle’s SPARC T4-1B server module is installed in a powered modular system.

**1. Press the Power button on the front of the server module.**

See [“Front and Rear Panel Components” on page 3](#) to locate the Power button.



---

**Note** – The server module power-on process can take several minutes to complete, depending on the amount of installed memory and the configured diagnostic level.

---

By default, the server module boots the Oracle Solaris OS.

**2. Perform any diagnostics that verify the results of servicing the server module.**

**Related Information**

- [“Detecting and Managing Faults” on page 5](#)
- [“Power On the Host \(Oracle ILOM\)” on page 122](#)



# Glossary

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## A

<b>ANSI SIS</b>	American National Standards Institute Status Indicator Standard.
<b>ASF</b>	Alert standard format (Netra products only).
<b>ASR</b>	Automatic system recovery.
<b>AWG</b>	American wire gauge.

---

## B

<b>blade</b>	Generic term for server modules and storage modules. See <i>server module</i> and <i>storage module</i> .
<b>blade server</b>	Server module. See <i>server module</i> .
<b>BMC</b>	Baseboard management controller.
<b>BOB</b>	Memory buffer on board.

---

## C

<b>chassis</b>	For servers, refers to the server enclosure. For server modules, refers to the modular system enclosure.
<b>CMA</b>	Cable management arm.

**CMM** Chassis monitoring module. The CMM is the service processor in the modular system. Oracle ILOM runs on the CMM, providing lights out management of the components in the modular system chassis. *See [Modular system](#) and [Oracle ILOM](#).*

**CMM Oracle ILOM** Oracle ILOM that runs on the CMM. *See [Oracle ILOM](#).*

---

## D

**DHCP** Dynamic Host Configuration Protocol.

**disk module or disk blade** Interchangeable terms for storage module. *See [storage module](#).*

**DTE** Data terminal equipment.

---

## E

**EIA** Electronics Industries Alliance.

**ESD** Electrostatic discharge.

---

## F

**FEM** Fabric expansion module. FEMs enable server modules to use the 10GbE connections provided by certain NEMs. *See [NEM](#).*

**FRU** Field-replaceable unit.

---

## H

**HBA** Host bus adapter.

**host** The part of the server or server module with the CPU and other hardware that runs the Oracle Solaris OS and other applications. The term *host* is used to distinguish the primary computer from the SP. *See [SP](#).*

---

## I

<b>ID PROM</b>	Chip that contains system information for the server or server module.
<b>IP</b>	Internet Protocol.

---

## K

<b>KVM</b>	Keyboard, video, mouse. Refers to using a switch to enable sharing of one keyboard, one display, and one mouse with more than one computer.
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## L

<b>LwA</b>	Sound power level.
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## M

<b>MAC</b>	Machine access code.
<b>MAC address</b>	Media access controller address.
<b>Modular system</b>	The rackmountable chassis that holds server modules, storage modules, NEMs, and PCI EMs. The modular system provides Oracle ILOM through its CMM.
<b>MSGID</b>	Message identifier.

---

## N

<b>name space</b>	Top-level Oracle ILOM CMM target.
<b>NEBS</b>	Network Equipment-Building System (Netra products only).

<b>NEM</b>	Network express module. NEMs provide 10/100/1000 Mbps Ethernet, 10GbE Ethernet ports, and SAS connectivity to storage modules.
<b>NET MGT</b>	Network management port. An Ethernet port on the server SP, the server module SP, and the CMM.
<b>NIC</b>	Network interface card or controller.
<b>NMI</b>	Nonmaskable interrupt.

---

## O

<b>OBP</b>	OpenBoot PROM.
<b>Oracle ILOM</b>	Oracle Integrated Lights Out Manager. Oracle ILOM firmware is preinstalled on a variety of Oracle systems. Oracle ILOM enables you to remotely manage your Oracle servers regardless of the state of the host system.
<b>Oracle Solaris OS</b>	Oracle Solaris operating system.

---

## P

<b>PCI</b>	Peripheral component interconnect.
<b>PCI EM</b>	PCIe ExpressModule. Modular components that are based on the PCI Express industry-standard form factor and offer I/O features such as Gigabit Ethernet and Fibre Channel.
<b>POST</b>	Power-on self-test.
<b>PROM</b>	Programmable read-only memory.
<b>PSH</b>	Predictive self healing.

---

## Q

<b>QSFP</b>	Quad small form-factor pluggable.
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## R

**REM** RAID expansion module. Sometimes referred to as an HBA *See* [HBA](#). Supports the creation of RAID volumes on drives.

---

## S

**SAS** Serial attached SCSI.

**SCC** System configuration chip.

**SER MGT** Serial management port. A serial port on the server SP, the server module SP, and the CMM.

**server module** Modular component that provides the main compute resources (CPU and memory) in a modular system. Server modules might also have onboard storage and connectors that hold REMs and FEMs.

**SP** Service processor. In the server or server module, the SP is a card with its own OS. The SP processes Oracle ILOM commands providing lights out management control of the host. *See* [host](#).

**SSD** Solid-state drive.

**SSH** Secure shell.

**storage module** Modular component that provides computing storage to the server modules.

---

## T

**TIA** Telecommunications Industry Association (Netra products only).

**Tma** Maximum ambient temperature.

---

## U

**UCP** Universal connector port.

<b>UI</b>	User interface.
<b>UL</b>	Underwriters Laboratory Inc.
<b>US. NEC</b>	United States National Electrical Code.
<b>UTC</b>	Coordinated Universal Time.
<b>UUID</b>	Universal unique identifier.

---

## W

<b>WWN</b>	World wide name. A unique number that identifies a SAS target.
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